

BRIGHAM YOUNG UNIVERSITY BULLETIN



THE GRADUATE SCHOOL CATALOG-1971/72

**Important Notice:** Students should consult the class schedule for the 1971-72 academic calendar.

# **Brigham Young University**

## **Bulletin**

**Graduate School Issue**

**1971-72**



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New Martin-Widtsoe Buildings (Life Sciences Center)

# University Calendar

## Fall Semester 1971

**June 30 (Wednesday):** Final date for receipt of completed graduate degree-seeking applications for Fall Semester 1971. (**July 31 [Saturday]:** Graduate nondegree applications.)

**September 9, 10 (Thursday, Friday):** Utah Conference on Higher Education.

**September 13, 14 (Monday, Tuesday):** Preschool Faculty Conference.

**September 16, 17, 18 (Thursday, Friday, Saturday):** Registration.

**September 20 (Monday):** Class instruction begins.

**September 22 (Wednesday):** First day changes in registration are permitted.

**October 1 (Friday):** Last day on which late registration may occur for Fall Semester and for adding classes.

**November 12 (Friday):** Midsemester registration for students released from missions and from active duty with the armed services since the close of late registration.

**November 19 (Friday):** Last day on which a student may officially withdraw from a class without special approval from the dean of his college.

**November 20 (Saturday):** Junior English Proficiency Examination.

**November 25, 26 (Thursday, Friday):** Thanksgiving recess.

**December 17 (Friday):** Last day of classes before Christmas recess.

**January 3 (Monday):** Classes resume after Christmas recess.

**January 7 (Friday):** Last day on which a student may officially withdraw from the University or drop classes.

**January 17, 18 (Monday, Tuesday):** End of formal class period for Fall Semester. Final examinations may not be given before January 19.

**January 19, 20, 21, 22, 24, 25, 26, 27 (Wednesday, Thursday, Friday, Saturday, Monday, Tuesday, Wednesday, Thursday):** Fall Semester final examination period.

## Spring Semester 1972

**December 17 (Friday):** Final date for receipt of completed graduate degree-seeking applications for Spring Semester 1972. (**January 17 [Monday]:** Graduate nondegree applications.)

**January 31, February 1, 2 (Monday, Tuesday, Wednesday):** Registration for all students.

**February 3 (Thursday):** Class instruction begins.

**February 7 (Monday):** First day changes in registration are permitted.

**February 16 (Wednesday):** Last day on which late registration may occur for Spring Semester and for adding classes.

- March 24 (Friday):** Midsemester registration for students released from missions and from active duty with the armed services since the close of late registration.
- March 31 (Friday):** Last day on which a student may officially withdraw from a class without special approval from the dean of his college.
- April 6, 7 (Thursday, Friday):** Spring vacation.
- May 5 (Friday):** Last day on which a student may officially withdraw from the University or drop classes.
- May 6 (Saturday):** Y Day.
- May 17, 18 (Wednesday, Thursday):** End of formal class period for Spring Semester. Final exams may not be given before May 19.
- May 19, 20, 22, 23, 24, 25 (Friday, Saturday, Monday, Tuesday, Wednesday, Thursday):** Spring Semester final examination period.
- May 26 (Friday):** Commencement exercises and college convocations.
- May 29 (Monday):** Memorial Day observed.

### **Summer Session 1972**

- May 1 (Monday):** Final date for receipt of completed graduate degree-seeking applications for First and Second Terms, Summer Session 1972. (**May 31 [Wednesday]:** Graduate nondegree applications.)
- June 5, 6, 7, 8, 9 (Monday, Tuesday, Wednesday, Thursday, Friday):** Special workshops and conferences.
- June 12 (Monday):** Registration.
- June 13 (Tuesday):** First Term begins.
- July 4 (Tuesday):** National holiday observed.
- July 14 (Friday):** First Term ends.
- July 15 (Saturday):** Second Term registration.
- July 17 (Monday):** Second Term begins.
- July 24 (Monday):** State holiday observed.
- August 18 (Friday):** Second Term ends—commencement.

# Administration and Faculty

## The First Presidency of The Church of Jesus Christ of Latter-day Saints

Joseph Fielding Smith .....	President
Harold B. Lee .....	First Counselor
N. Eldon Tanner .....	Second Counselor

## Board of Trustees of Brigham Young University

Joseph Fielding Smith .....	President
Harold B. Lee .....	First Vice-President
N. Eldon Tanner .....	Second Vice-President

Spencer W. Kimball	Richard L. Evans	Marion D. Hanks
Ezra Taft Benson	Howard W. Hunter	A. Theodore Tuttle
Mark E. Petersen	Gordon B. Hinckley	Paul H. Dunn
Delbert L. Stapley	Thomas S. Monson	John H. Vandenberg
Marion G. Romney	Alvin R. Dyer	Belle S. Spafford
LeGrand Richards	Boyd K. Packer	

## Executive Committee

## Board of Trustees of Brigham Young University

Delbert L. Stapley, Chairman	LeGrand Richards	Boyd K. Packer
Marion G. Romney	Gordon B. Hinckley	Marion D. Hanks

## Office of the Church Commissioner of Education

Commissioner .....	Neal A. Maxwell
Associate Commissioner, Business and Finance, and Secretary of the Executive Committee and Board of Trustees .....	Dee F. Andersen
Associate Commissioner, Colleges and Schools .....	Kenneth H. Beesley
Associate Commissioner, Seminaries and Institutes .....	Joe J. Christensen

## University Administrative Officers\*

President .....	Ernest L. Wilkinson
Executive Vice-President .....	Ben E. Lewis
Academic Vice-President .....	Robert K. Thomas
Vice-President and General Counsel .....	Clyde D. Sandgren
Associate Academic Vice-President .....	Robert J. Smith
Assistant Academic Vice-President .....	William R. Siddoway
Assistant Vice-President for Business .....	Fred A. Schwendiman
Administrative Assistant to the President .....	Dean A. Peterson
Assistant to the President in Charge of Communications .....	Heber G. Wolsey
Dean of Students .....	J. Elliot Cameron
Director of Physical Plant .....	Sam F. Brewster

\*These officers constitute the Administrative Council of the University.

## Graduate School

Dean of the Graduate School .....	Chauncey C. Riddle
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**Deans of Colleges**

Biological and Agricultural Sciences .....	A. Lester Allen
Business .....	Weldon J. Taylor
Education .....	Stephen L. Alley
Family Living .....	Blaine R. Porter
Fine Arts and Communications .....	Lorin F. Wheelwright
General College .....	Lester B. Whetten
Humanities .....	Bruce B. Clark
Industrial and Technical Education .....	Ernest C. Jeppsen
Nursing .....	Maxine Cope
Physical and Engineering Sciences .....	Armin J. Hill
Physical Education .....	Milton F. Hartvigsen
Religious Instruction .....	Daniel H. Ludlow
Social Sciences .....	Martin B. Hickman

**Deans and Directors of General Areas**

Admissions and Records .....	Franklin McKean
Division of Continuing Education .....	Harold Glen Clark
Director of Research .....	Leo P. Vernon
Director of Summer School .....	Dean A. Peterson

**Graduate Council****Representatives of Academic Areas**

Richard D. Sagers, Biological and Agricultural Sciences. Term expires September 1, 1972.
Edward L. Christensen, Business. Term expires September 1, 1972.
A. John Clarke, Education. Term expires September 1, 1972.
John N. Cannon, Engineering Sciences. Term expires September 1, 1971.
Duane Laws, Family Living. Term expires September 1, 1973.
Don L. Earl, Fine Arts. Term expires September 1, 1972.
M. Carl Gibson, Humanities. Term expires September 1, 1973.
Kay S. Mortensen, Industrial and Technical Education. Term expires September 1, 1971.
Eugene E. Campbell, Social Sciences. Term expires September 1, 1973.
Donald W. Robinson, Physical Sciences. Term expires September 1, 1973.
Donald D. Shaw, Physical Education. Term expires September 1, 1973.
LaMar Berrett, Religious Instruction. Term expires September 1, 1971.

**Members at Large**

Dean B. Farnsworth. Term expires September 1, 1972.
Arthur R. Watkins. Term expires September 1, 1973.
Bertrand F. Harrison. Term expires September 1, 1973.
Howard C. Nielson. Term expires September 1, 1971.
Chauncey C. Riddle, Dean, Graduate School, Chairman.

**Ex Officio**

Robert K. Thomas, Academic Vice-President.
Donald K. Nelson, Director of Libraries.
Leo P. Vernon, Director of Research.

**Directors of Academic Programs**

Graduate Department of Library and Information Sciences .....	H. Thayne Johnson
Institute of Government Service .....	Karl N. Snow, Jr.
Master of Business Administration .....	Robert H. Daines

**Department Chairmen and Graduate Coordinators**

<b>Department</b>	<b>Chairman</b>	<b>Coordinator</b>
Accounting .....	Leon W. Woodfield	Dale H. Taylor
Agronomy and Horticulture.....	Rudger H. Walker	W. Derby Laws
Animal Science .....	R. Phil Shumway	R. Phil Shumway
Anthropology and Archaeology.....	Merlin G. Myers	M. Wells Jakeman
Art .....	Floyd E. Breinholt	Richard L. Gunn
Astronomy (See Physics and Astronomy)		
Botany and Range Science.....	Dayna L. Stocks	Howard C. Stutz
Business Education .....	G. Edward Nelson	R. DerMont Bell
Chemical Engineering Science .....	L. Douglas Smoot	Richard W. Hanks
Chemistry .....	K. LeRoi Nelson	Keith P. Anderson
Child Development and Family Relationships .....	J. Joel Moss	Boyd C. Rollins
Civil Engineering Science.....	D. Allan Firmage	S. Olani Durrant
Classical and Asian Languages.....	J. Reuben Clark III	J. Reuben Clark III
Communications .....	J. Morris Richards	Owen S. Rich
Economics .....	Larry T. Wimmer	J. Kenneth Davies
Education		
Educational Administration ..	Ralph B. Smith	Curtis N. Van Alfen
Educational Psychology .....	Rex D. Pinegar	Curtis N. Van Alfen
Elementary Education .....	Max J. Berryessa	Curtis N. Van Alfen
Secondary and Foundations of Education .....	Wallace E. Allred	Curtis N. Van Alfen
Electrical Engineering Science.....	Ferril A. Losee	Gayle F. Miner
English .....	Dale H. West	Dean B. Farnsworth
Food Science and Nutrition .....	John Hal Johnson	Marion Bennion
French and Italian .....	John A. Green	Harold W. Lee
Geography .....	Robert L. Layton	Robert L. Layton
Geology .....	J. Keith Rigby	Lehi F. Hintze
Germanic and Slavic Languages .....	Arthur R. Watkins	Murray F. Smith
Health Sciences .....	Ray Watters	Donald D. Shaw
History .....	De Lamar Jensen	Richard Schmutz
Home Economics Education .....	Ruth E. Brasher	Ruth E. Brasher
Humanities and Comparative Literature .....	Ralph A. Britsch	Ralph A. Britsch
Industrial Education .....	Edwin C. Hinckley	Edwin C. Hinckley
Linguistics .....	Robert W. Blair	Robert W. Blair
Mathematics .....	Kenneth L. Hillam	Kenneth L. Hillam
Mechanical Engineering Science .....	John M. Simonsen	John N. Cannon
Microbiology .....	Don H. Larsen	David M. Donaldson
Music .....	A. Harold Goodman	Don L. Earl
Physical Education .....	Elmo S. Roundy	Donald D. Shaw
Physics and Astronomy .....	John H. Gardner	Andrew L. Gardner
Political Science .....	Ray C. Hillam	Doyle W. Buckwalter
Psychology .....	Darhl M. Pedersen	Robert J. Howell
Recreation Education .....	William J. Hafen	Donald D. Shaw
Religious Instruction— Ancient Scripture .....	Ellis T. Rasmussen	Ellis T. Rasmussen
Religious Instruction—Church History and Doctrine .....	LaMar C. Berrett	LaMar C. Berrett
Sociology .....	Evan T. Peterson	Phillip R. Kunz
Spanish and Portuguese .....	M. Carl Gibson	M. Carl Gibson
Speech and Dramatic Arts .....	Parley W. Newman	Parley W. Newman
Statistics .....	H. Gill Hilton	Melvin Carter
Zoology .....	Joseph R. Murphy	Ferron L. Andersen

### Coordinators of Areas

Latin-American Studies .....	Lyman S. Shreeve, Sr.
Asian Studies .....	Spencer J. Palmer

### The Faculty of the Graduate School

The faculty of the Graduate School consists of members of the general faculty who are approved by the dean of the Graduate School from among those who hold the rank of professor or associate professor, or assistant professor with a doctoral degree. For special reason related to exceptional qualification, the Graduate Council is authorized to appoint to the graduate faculty a member who does not hold the doctoral degree.

### Emeriti

Beulah Ream Allen .....	Professor Emeritus of Nursing (1961) Diploma, Illinois Training School for Nurses, Cook County Hospital, Chicago, Illinois, 1922; B.A., University of Utah, 1928; M.D., University of California, 1932.
Owen L. Barnett ....	Associate Professor Emeritus of Educational Administration B.S., M.S., Brigham Young University, 1923, 1927. (1950)
Clarence S. Boyle .....	Professor Emeritus of Marketing (1927) B.S., Brigham Young University, 1924; M.S., Ed.D., New York University, 1926, 1941.
Jennie Campbell .....	Associate Professor Emeritus of Education (1952) B.S., Brigham Young University, 1928; M.A., Teachers College, Columbia University.
Clawson Y. Cannon, Sr. ....	Professor Emeritus of Animal Science (1956) B.S., Utah State University, 1913; M.S., Ph.D., Iowa State College, 1924, 1927.
Thomas E. Cheney .....	Professor Emeritus of English (1945) B.S., Utah State University, 1930; M.A., University of Idaho, 1936.
Monroe H. Clark .....	Associate Professor Emeritus of Philosophy of Education and Guidance (1945) B.A., Columbia University, 1923; M.A., Brigham Young University, 1927.
Evan M. Croft .....	Associate Professor Emeritus of Business Education (1936) B.S., Brigham Young University, 1929; M.S., University of Southern California, 1940.
Gerrit de Jong, Jr. ....	Professor Emeritus of Modern Languages; Dean Emeritus, College of Fine Arts (1925) B.A., M.A., University of Utah, 1920, 1925; Ph.D., Stanford University, 1933.
J. Orval Ellsworth .....	Professor Emeritus of Religion (1954) B.S., Utah State University, 1917; M.S., Ph.D., Cornell University, 1924, 1926.
Harvey Fletcher .....	Professor Emeritus of Physics; Dean Emeritus of College of Physical and Engineering Sciences (1952) B.S., Brigham Young University, 1907; Ph.D., Chicago University, 1911; hon. Sc.D., Columbia University, 1935; hon. Sc.D., Kenyon College, 1942; hon. Sc.D., Stevens Institute of Technology, 1942; hon. Sc.D., Case School of Applied Sciences, 1942; hon. Sc.D., University of Utah, 1944; hon. Sc.D., Brigham Young University, 1954.
LeRoy R. Hafen .....	Professor Emeritus of History (1954) B.A., Brigham Young University, 1916; M.A., University of Utah, 1919; Ph.D., University of California, 1924; Litt.D., University of Colorado, 1935.
Wayne B. Hales .....	Professor Emeritus of Physics and Mathematics (1930) B.A., Brigham Young University, 1916; M.A., University of Utah, 1923; Ph.D., California Institute of Technology, 1926.
George H. Hansen .....	Professor Emeritus of Geology and Geography (1927) B.S., Utah State University, 1918; M.S., Ph.D., George Washington University, 1925, 1927.
Charles J. Hart .....	Professor Emeritus of Recreation and of Physical and Health Education (1925) B.S., Utah State University, 1922; M.A., Ed.D., New York University, 1932, 1945.
C. Lynn Hayward .....	Professor Emeritus of Zoology (1930) B.S., M.S., Brigham Young University, 1927, 1931; Ph.D., University of Illinois, 1941.
Gustave O. Larson .....	Associate Professor Emeritus of History and History of Religion (1954) B.A., M.A., University of Utah, 1920, 1926.
Florence Jepperson Madsen .....	Professor Emeritus of Music (1910) B.M., M.M., Chicago Musical College, 1926, 1927; Doctor of Music, Boguslawski College of Music, 1932; B.A., Brigham Young University, 1934; M.M., hon. Doctor of Music, Chicago College of Music, 1933.

<b>Franklin Madsen</b>	Professor Emeritus of Music (1920)
B.A., M.A., Brigham Young University, 1925, 1931; B.M., 1926; M.M., 1927; B.M.E., 1928; Mus. Doc., 1929; M.M.E., 1932; hon. Doctor of Music Education, Boguslawski College of Music, 1933; hon. Doctor of Music Education, Chicago College of Music, 1934.	
<b>J. C. Moffitt</b>	Professor Emeritus of Educational Administration (1953)
B.S., M.S., Brigham Young University, 1926, 1929; Ph.D., University of Chicago, 1940.	
<b>Sadie O. Morris</b>	Professor Emeritus of Food and Nutrition (1957)
B.S., M.S., Utah State University, 1921, 1922; Ph.D., Columbia University, 1933.	
<b>T. Earl Pardoe</b>	Professor Emeritus of Speech (1919)
B.A., Brigham Young University, 1925; M.A., University of Southern California, 1931; Ph.D., Louisiana State University, 1936.	
<b>Hugh W. Peterson</b>	Professor Emeritus of Chemistry (1927)
B.A., M.A., Brigham Young University, 1916, 1928; Ph.D., State University of Iowa, 1936.	
<b>J. Wyley Sessions</b>	Professor Emeritus of Religious Philosophy (1939)
B.S., Utah State University, 1911; M.A., University of Idaho, 1928.	
<b>Sidney B. Sperry</b>	Professor Emeritus of Old Testament Languages and Literature (1932)
B.A., University of Utah, 1917; M.A., Ph.D., University of Chicago, 1926, 1931.	
<b>Orea B. Tanner</b>	Associate Professor Emeritus of English (1938)
B.A., Brigham Young University, 1932; M.A., Columbia University, 1953.	
<b>Vasco M. Tanner</b>	Professor Emeritus of Zoology (1925)
B.A., Brigham Young University, 1915; M.A., University of Utah, 1920; Ph.D., Stanford University, 1925.	
<b>L. Elliott Tuttle</b>	Associate Professor Emeritus of Geography (1936)
B.S., M.S., Brigham Young University, 1938, 1948.	
<b>Karl E. Young</b>	Professor Emeritus of English (1930)
B.A., M.A., Oxford University (England), 1930, 1934.	

## Faculty

<b>George M. Addy</b>	Professor of History (1957)
B.A., M.A., Brigham Young University, 1948, 1950; Ph.D., Duke University, 1957.	
<b>Thomas G. Alexander</b>	Associate Professor of History (1964)
B.S., M.S., Utah State University, 1960, 1961; Ph.D., University of California at Berkeley, 1965.	
<b>A. Lester Allen</b>	Professor of Zoology;
B.A., Ph.D., University of California at Los Angeles, 1946, 1951.	Dean, College of Biological and Agricultural Sciences (1954)
<b>James B. Allen</b>	Associate Professor of History (1963)
B.S., Utah State University, 1954; M.A., Brigham Young University, 1956; Ph.D., University of Southern California, 1963.	
<b>Mark K. Allen</b>	Professor of Psychology (1946)
B.A., Brigham Young University, 1926; M.A., Ph.D., Stanford University, 1935, 1955.	
<b>Stephen L. Alley</b>	Professor of Educational Philosophy;
B.S., M.S., University of Utah, 1947, 1951; Ed.D., Harvard University, 1958.	Dean, College of Education (1956)
<b>Dorald M. Allred</b>	Professor of Zoology (1956)
B.A., M.A., Brigham Young University, 1950, 1951; Ph.D. University of Utah, 1954.	
<b>G. Hugh Allred</b>	Associate Professor of Child Development and Family Relationships (1966)
B.A., M.A., Brigham Young University, 1957, 1960; Ed.D., University of Oregon, 1966.	
<b>R. Chase Allred</b>	Professor of Agronomy (1955)
B.S., Brigham Young University, 1948; M.S., Kansas State College, 1949; Ph.D., University of Nebraska, 1952.	
<b>Philip E. Allsen</b>	Professor of Physical Education for Men (1966)
B.S., Ricks College, 1955; M.S., Brigham Young University, 1960; Ed.D., University of Utah, 1965.	
<b>Ferron Lee Andersen</b>	Associate Professor of Zoology (1966)
B.S., M.S., Utah State University, 1957, 1960; M.S., University of Illinois, 1962; Ph.D., Utah State University, 1963.	
<b>H. Verlan Andersen</b>	Professor of Accounting (1965)
B.S., Brigham Young University, 1940; J.D., Stanford University, 1946; LL.M., Harvard University, 1948.	

## ADMINISTRATION AND FACULTY

<b>William Ralph Andersen</b>	Associate Professor of Botany (1966)
B.S., M.S., Utah State University, 1956, 1958; Ph.D., University of California, 1963.	
<b>C. Dixon Anderson</b>	Associate Professor of Spanish (1956)
B.A., Brigham Young University, 1953; M.A., Ph.D., University of Texas, 1956, 1965.	
<b>Keith P. Anderson</b>	Professor of Chemistry (1953)
B.A., Brigham Young University, 1946; Ph.D., Cornell University, 1950.	
<b>Lane K. Anderson</b>	Assistant Professor of Accounting (1970)
B.A., M.Acc., Brigham Young University, 1965, 1966; MBA, Ph.D., University of Wisconsin, 1970, 1970; CPA, Utah, 1970	
<b>Richard L. Anderson</b>	Professor of History and Scripture (1955)
B.A., M.A., Brigham Young University, 1951, 1957; LL.B., Harvard University, 1954; Ph.D., University of California at Berkeley, 1962.	
<b>Hyrum L. Andrus</b>	Professor of Scripture (1956)
B.S., Ricks College, 1951; M.S., Brigham Young University, 1952; DSS, Syracuse University, 1955.	
<b>J. Roman Andrus</b>	Professor of Art and Education (1943)
B.S., M.S., Brigham Young University, 1942, 1943; Ed.D., University of Colorado, 1958; Art Students League, L.A. Art Institute.	
<b>Marilyn Arnold</b>	Assistant Professor of English (1969)
B.A., M.A., Brigham Young University, 1957, 1958; Ph.D., University of Wisconsin, 1968.	
<b>Carlos E. Asay</b>	Professor of Education (1969)
B.S., University of Utah, 1953; M.A., Long Beach State College, 1958; Ed.D., University of Utah, 1967.	
<b>Clarence D. Ashton</b>	Associate Professor of Horticulture (1951)
B.S., Brigham Young University, 1929.	
<b>Peter P. Ashworth</b>	Assistant Professor of Spanish (1967)
B.A., Brigham Young University, 1961; Ph.D., University of Oklahoma, 1967.	
<b>Hyrum J. Babcock</b>	Associate Professor of Elementary Education (1954)
B.A., M.A., Ph.D., University of California, 1939, 1940, 1953.	
<b>Milton V. Backman, Jr.</b>	Professor of History of Religion (1960)
B.S., M.A., University of Utah, 1954, 1955; Ph.D., University of Pennsylvania, 1959.	
<b>James Logan Baer</b>	Assistant Professor of Geology (1969)
B.S., Ohio State University, 1957; M.S., Ph.D., Brigham Young University, 1962, 1968.	
<b>Hugh Baird</b>	Associate Professor of Education (1963)
B.S., M.S., University of Utah, 1954, 1954; Ed.D., University of California at Berkeley, 1962.	
<b>Joseph O. Baker</b>	Assistant Professor of German (1967)
B.A., University of Utah, 1964; Ph.D., Tulane University, 1968.	
<b>Ariel S. Ballif</b>	Professor of Sociology; Foreign-Student Adviser (1938)
B.S., Brigham Young University, 1925; M.A., Ph.D., University of Southern California, 1937, 1945.	
<b>Jae R. Ballif</b>	Professor of Physics (1962)
B.S., Brigham Young University, 1953; M.A., Ph.D., University of California at Los Angeles, 1961, 1962.	
<b>Blauer L. Bangerter</b>	Professor of Physical Education (1953)
B.A., Brigham Young University, 1951; M.S., Ph.D., University of Utah, 1955, 1964.	
<b>Dee H. Barker</b>	Professor of Chemical Engineering (1959)
B.S., Ph.D., University of Utah, 1948, 1951; Registered Professional Engineer, Utah, 1963.	
<b>Clifford R. Barnes</b>	Associate Professor of Music (1968)
B.Mus., M.A., Ph.D., University of Southern California, 1953, 1957, 1965.	
<b>Howard W. Barnes</b>	Associate Professor of Business Management (1968)
A.B., Harvard College, 1955; MBA, University of Southern California, 1963; Ph.D., Technische Universität Braunschweig, 1968.	
<b>J. Dean Barnett</b>	Professor of Physics (1958)
B.A., Ph.D., University of Utah, 1954, 1959.	
<b>Howard H. Barron</b>	Professor of Religious Education (1953)
B.S., M.S., Utah State University, 1943, 1950; Ed.D., University of Utah, 1953.	
<b>George S. Barrus</b>	Associate Professor of Communications (1967)
B.S., University of Utah, 1950; M.A., Brigham Young University, 1964; Ph.D., University of Iowa, 1970.	
<b>Cliff S. Barton</b>	Professor of Civil Engineering; Assistant Dean, College of Physical and Engineering Sciences (1959)
B.S., Utah State University, 1947; M.S., Ph.D., Rensselaer Polytechnic Institute, 1953, 1959.	

## ADMINISTRATION AND FACULTY

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<b>James R. Barton</b>	Professor of Civil Engineering (1967)
B.S., University of New Mexico, 1944; M.S., University of Colorado, 1946; Ph.D., Colorado State University, 1958; Registered Engineer, Utah, 1949.	
<b>J. LaVar Bateman</b>	Professor of Speech (1949)
B.A., Brigham Young University, 1941; M.S., Ph.D., University of Wisconsin, 1947, 1950.	
<b>Merrill J. Bateman</b>	Professor of Economics (1967)
B.S., University of Utah, 1960; Ph.D., Massachusetts Institute of Technology, 1965.	
<b>Edith Bartholomew Bauer</b>	Professor of Educational Psychology (1945)
B.A., M.A., Brigham Young University, 1930, 1946; Ph.D., University of California at Berkeley, 1956.	
<b>Jay V. Beck</b>	Professor of Microbiology (1951)
B.A., M.A., Brigham Young University, 1933, 1936; Ph.D., University of California at Berkeley, 1940.	
<b>Raymond E. Beckham</b>	Associate Professor of Communications (1949)
B.S., M.A., Brigham Young University, 1949, 1969.	
<b>R. DerMont Bell</b>	Professor of Business Education (1957)
B.S., M.S., Brigham Young University, 1955, 1956; Ph.D., University of Southern California, 1960.	
<b>Parley L. Belnap</b>	Assistant Professor of Music (1965)
B.A., M.A., Brigham Young University, 1950, 1956; Premier Prix, Royal Flemish Conservatory, Belgium, 1960; Diplome Supérieur, Royal Flemish Conservatory, Belgium, 1964.	
<b>W. Dwayne Belt</b>	Professor of Secondary Education (1961)
B.A., Brigham Young University, 1952; M.A., Ed.D., Colorado State College, 1958, 1961.	
<b>Marion Bennion</b>	Professor of Food Science and Nutrition (1952)
B.S., Utah State University, 1947; M.S., Teachers College, Columbia University, 1949; Ph.D., University of Wisconsin, 1956.	
<b>Robert C. Bennion</b>	Associate Professor of Psychology (1961)
B.A., Brigham Young University, 1956; M.A., Ph.D., Ohio State University, 1959, 1961.	
<b>Dale L. Berge</b>	Assistant Professor of Anthropology and Archaeology (1967)
B.S., M.A., Brigham Young University, 1961, 1964; M.A., Ph.D., University of Arizona, 1967, 1968.	
<b>LaMar C. Berrett</b>	Associate Professor of Religious Instruction (1963)
B.S., University of Utah, 1952; M.S., Ed.D., Brigham Young University, 1960, 1963.	
<b>Paul O. Berrett</b>	Associate Professor of Electrical Engineering (1964)
B.S., University of Utah, 1953; M.S., University of Southern California, 1955; Ph.D., University of Utah, 1965.	
<b>William E. Berrett</b>	Professor of Religious Instruction (1948)
B.A., LL.B., University of Utah, 1924, 1933; J.D., 1966.	
<b>Max J. Berryessa</b>	Professor of Elementary Education (1948)
B.S., M.S., Brigham Young University, 1948, 1949; Ed.D., Stanford University, 1959.	
<b>Myron G. Best</b>	Associate Professor of Geology (1965)
B.S., University of Utah, 1957; Ph.D., University of California at Berkeley, 1961.	
<b>Rollie Ray Bestor</b>	Assistant Professor of Physical Education (1969)
B.S., M.S., University of Wisconsin, 1954, 1958; Ed.D., Brigham Young University, 1969.	
<b>Gary Boyd Beus</b>	Assistant Professor of Statistics (1967)
B.A., Brigham Young University, 1962; M.S., Virginia Polytechnic Institute, 1965.	
<b>James L. Bills</b>	Associate Professor of Chemistry (1962)
B.S., University of Utah, 1958; Ph.D., Massachusetts Institute of Technology, 1963.	
<b>Russell H. Bishop</b>	Assistant Professor of Secondary Education (1966)
B.A., M.A., University of Utah, 1954, 1964; Ph.D., University of Oregon, 1966.	
<b>Harold J. Bissell</b>	Professor of Geology (1938)
B.S., Brigham Young University, 1934; M.S., Ph.D., University of Iowa, 1936, 1948.	
<b>Harvey B. Black</b>	Instructional Research Specialist; Professor of Education (1970)
A.B., M.A., Brigham Young University, 1950, 1954; Ph.D., Indiana University, 1962.	
<b>Angus U. Blackham</b>	Professor of Chemistry (1952)
B.A., Brigham Young University, 1949; M.A., Ph.D., University of Cincinnati, 1950, 1952.	
<b>Robert W. Blair</b>	Associate Professor of Linguistics (1959)
B.A., M.A., Brigham Young University, 1955, 1957; Ph.D., Indiana University, 1964.	
<b>Reed F. Blake</b>	Assistant Professor of Sociology (1967)
B.S., M.S., Brigham Young University, 1957, 1959; Ph.D., Utah State University, 1969.	

## ADMINISTRATION AND FACULTY

<b>Mae Blanch</b>	Assistant Professor of English (1958)
B.A., Brigham Young University, 1950; Ph.D., University of Colorado, 1966.	
<b>Walter D. Bowen</b>	Associate Professor of Religious Instruction (1964)
B.S., M.S., Ed.D., Brigham Young University, 1957, 1958, 1965.	
<b>Lawrence S. Bowman</b>	Associate Professor of Electrical Engineering (1967)
B.S., M.S., Ph.D., University of Utah, 1957, 1961, 1964.	
<b>Reed H. Bradford</b>	Professor of Sociology (1946)
B.A., Brigham Young University, 1937; M.A., Louisiana State University, 1939; M.A., Ph.D., Harvard University, 1941, 1946.	
<b>Rulon L. Bradley</b>	Professor of Communications (1965)
B.A., Brigham Young University, 1947; M.S., Ph.D., University of Utah, 1954, 1962.	
<b>Jerald S. Bradshaw</b>	Associate Professor of Chemistry (1966)
B.S., University of Utah, 1955; Ph.D., University of California at Los Angeles, 1963.	
<b>Merrill Kay Bradshaw</b>	Associate Professor of Music (1957)
B.A., M.A., Brigham Young University, 1954, 1955; M.Mus., D.Mus.A., University of Illinois, 1956, 1962.	
<b>Willard H. Bradshaw</b>	Associate Professor of Microbiology (1961)
B.S., M.S., Brigham Young University, 1952, 1953; Ph.D., University of California at Berkeley, 1957.	
<b>William S. Bradshaw</b>	Assistant Professor of Zoology (1970)
B.A., Harvard University, 1961; Ph.D., University of Illinois, 1968.	
<b>Marion B. Brady</b>	Associate Professor of English (1965)
B.A., M.A., Brigham Young University, 1950, 1951; Ph.D., University of Utah, 1966.	
<b>Lee Fred Braithwaite</b>	Assistant Professor of Zoology (1962)
B.S., M.S., Ph.D., Brigham Young University, 1959, 1962, 1966.	
<b>Ruth E. Brasher</b>	Associate Professor of Home Economics Education (1969)
B.S., Brigham Young University, 1951; M.A., University of Maryland, 1959; Ph.D., Utah State University, 1969.	
<b>Floyd E. Breinholt</b>	Associate Professor of Art (1961)
B.S., M.E., Brigham Young University, 1937, 1953.	
<b>Willis H. Brimhall</b>	Associate Professor of Geology (1956)
B.S., Brigham Young University, 1949; M.S., University of Arizona, 1961; BES, Brigham Young University, 1960; Ph.D., Rice University, 1966.	
<b>Merlin B. Brinkerhoff</b>	Assistant Professor of Sociology (1968)
B.A., M.S., Brigham Young University, 1964, 1965; Ph.D., University of Washington, 1968.	
<b>Ralph A. Britsch</b>	Professor of Humanities and Comparative Literature (1938)
B.A., M.A., Brigham Young University, 1933, 1951.	
<b>Ralph Lanier Britsch</b>	Assistant Professor of History (1966)
B.A., M.A., Brigham Young University, 1963, 1964; Ph.D., Claremont Graduate School, 1967.	
<b>Todd A. Britsch</b>	Assistant Professor of German and Humanities (1966)
B.A., Brigham Young University, 1962; M.A., Ph.D., Florida State University, 1965, 1966.	
<b>H. Smith Broadbent</b>	Professor of Chemistry (1946)
B.S., Brigham Young University, 1942; Ph.D., Iowa State University, 1946.	
<b>Bruce Leonard Brown</b>	Assistant Professor of Psychology (1968)
B.S., M.S., Brigham Young University, 1965, 1968; Ph.D., McGill University, 1969.	
<b>Thomas H. Brown</b>	Professor of French (1959)
B.A., Brigham Young University, 1955; M.A., Ph.D., University of Illinois, 1957, 1960.	
<b>Loren C. Bryner</b>	Professor of Chemistry (1935)
B.S., M.S., Brigham Young University, 1928, 1930; Ph.D., Iowa State University, 1934.	
<b>Eugene Taylor Buckner</b>	Assistant Professor of Education (1970)
B.S., M.S., Ph.D., Brigham Young University, 1954, 1962, 1970.	
<b>Doyle W. Buckwalter</b>	Associate Professor of Political Science (1964)
B.A., M.A., Brigham Young University, 1963, 1964; Ph.D., University of Michigan, 1968.	
<b>Wallace Don Budge</b>	Associate Professor of Civil Engineering (1964)
B.S., M.S., Utah State University, 1959, 1961; Ph.D., University of Colorado, 1964.	
<b>Kenneth C. Bullock</b>	Professor of Geology (1943)
B.S., M.A., Brigham Young University, 1940, 1942; Ph.D., University of Wisconsin, 1949.	
<b>Gary L. Bunker</b>	Associate Professor of Psychology (1969)
B.A., M.A., Brigham Young University, 1960, 1961; Ph.D., University of California at Berkeley, 1966.	

## ADMINISTRATION AND FACULTY

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<b>M. Dallas Burnett</b>	Associate Professor of Communications (1958) B.S., Brigham Young University, 1954; MSJ, Ph.D., Northwestern University, 1958, 1967.
<b>Wesley R. Burr</b>	Assistant Professor of Child Development and Family Relationships (1969) B.S., M.S., Brigham Young University, 1960, 1961; Ph.D., University of Minnesota, 1967.
<b>Percy E. Burrup</b>	Professor of Educational Administration (1952) B.S., M.S., Utah State University, 1932, 1941; Ed.D., Colorado State College of Education, 1951.
<b>Alma P. Burton</b>	Professor of Religious Instruction (1948) B.S., Utah State University, 1948; M.S., Brigham Young University, 1950; Ed.D., University of Utah, 1957.
<b>Robert C. Burton</b>	Associate Professor of Mathematics (1964) B.S., Brigham Young University, 1956; Ph.D., University of North Carolina, 1963.
<b>Sheril Dale Burton</b>	Associate Professor of Microbiology (1967) B.S., M.S., Brigham Young University, 1959, 1961; Ph.D., Oregon State University, 1964.
<b>Jess R. Bushman</b>	Professor of Geology (1955) B.A., Brigham Young University, 1949; Ph.D., Princeton University, 1959.
<b>Eliot A. Butler</b>	Professor of Chemistry (1956) B.S., Ph.D., California Institute of Technology, 1952, 1956.
<b>C. Boyd Call</b>	Associate Professor of Physical Education (1960) B.S., University of Utah, 1950; Physical Therapy Certificate from Children's Hospital in Los Angeles, 1953; M.S., Brigham Young University, 1963; Ph.D., University of Oregon, 1967.
<b>Ivan T. Call</b>	Associate Professor of Business Management (1960) B.S., Brigham Young University, 1958; MBA, Indiana University, 1959.
<b>Sterling G. Callahan</b>	Professor of Secondary Education (1953) B.A., Brigham Young University, 1937; M.A., George Washington University, 1947; Ed.D., University of Virginia, 1953.
<b>James B. Cameron</b>	Associate Professor of Accounting (1969) B.S., University of Utah, 1956; MBA, University of California at Los Angeles, 1958; Ph.D., Montana State University, 1967.
<b>J. Elliot Cameron</b>	Professor of Education; Dean of Students (1962) B.S., M.S., Ed.D., Brigham Young University, 1949, 1949, 1967.
<b>Eugene E. Campbell</b>	Professor of History (1956) B.A., M.A., University of Utah, 1939, 1940; Ph.D., University of Southern California, 1952.
<b>John N. Cannon</b>	Professor of Mechanical Engineering (1957) BSME, M.S., University of Utah, 1952, 1955; Ph.D., Stanford University, 1965; Registered Professional Engineer, Utah, 1958.
<b>Kenneth L. Cannon</b>	Professor of Child Development and Family Relationships (1956) B.S., Brigham Young University, 1935; M.S., Ph.D., Iowa State College, 1948, 1954.
<b>Louis B. Cardon</b>	Associate Professor of History (1960) B.A., University of Arizona, 1950; M.A., Ph.D., University of California at Berkeley, 1957, 1965.
<b>Gary Carlson</b>	Professor of Computer Science; Director of the Computer Research Center (1963) B.A., M.A., Ph.D., University of California at Los Angeles, 1956, 1958, 1962.
<b>Melvin W. Carter</b>	Professor of Statistics (1961) B.S., Arizona State University, 1952; M.S., Ph.D., North Carolina State, 1954, 1956.
<b>Raymond Nielson Castle</b>	Professor of Chemistry (1970) B.S., University of Idaho, 1939; M.A., Ph.D., University of Colorado, 1941, 1944
<b>Arthur O. Chapman</b>	Professor of Zoology (1959) B.A., Brigham Young University, 1941; M.A., University of Kansas, 1949; Ph.D., University of Nebraska, 1953.
<b>A. Norton Chaston</b>	Associate Professor of Electrical Engineering (1957) B.S., University of Utah, 1951; M.S., Brigham Young University, 1963.
<b>Paul R. Cheesman</b>	Assistant Professor of Religious Instruction (1966) B.A., San Diego State College, 1944; MRE, DRE, Brigham Young University, 1965, 1967.
<b>Dean C. Christensen</b>	Professor of Education (1957) B.S., M.S., Utah State University, 1938, 1948; Ed.D., University of Oregon, 1957.
<b>Earl M. Christensen</b>	Professor of Botany (1949) B.S., M.S., University of Utah, 1947, 1949; Ph.D., University of Wisconsin, 1954.

<b>Edward L. Christensen</b>	Professor of Business Management (1953) B.S., M.S., Ph.D., University of Utah, 1938, 1939, 1953.
<b>James J. Christensen</b>	Professor of Chemical Engineering (1957) B.S., M.S., University of Utah, 1953, 1956; Ph.D., Carnegie Institute of Technology, 1957.
<b>Ross T. Christensen</b>	Professor of Archaeology and Anthropology (1952) B.A., M.A., Brigham Young University, 1943, 1947; Ph.D., University of Arizona, 1956.
<b>Henry N. Christiansen</b>	Associate Professor of Civil Engineering (1965) B.S., Utah State University, 1957; M.S., Ph.D., Stanford University, 1958, 1962.
<b>John R. Christiansen</b>	Professor of Sociology (1957) B.S., M.S., Utah State University, 1949, 1952; Ph.D., University of Wisconsin, 1955.
<b>Bruce B. Clark</b>	Professor of English; Dean, College of Humanities (1950) B.A., University of Utah, 1943; M.A., Brigham Young University, 1948; Ph.D., University of Utah, 1951.
<b>Dwight P. Clark</b>	Associate Professor of Chemical Engineering (1964) B.S., University of Utah, 1960; Ph.D., Oregon State University, 1965.
<b>Harold Glen Clark</b>	Professor of Education; Dean of Continuing Education (1946) B.S., Brigham Young University, 1928; M.S., University of Southern California, 1934; Ed.D., George Washington University, 1942.
<b>H. Clifford Clark</b>	Associate Professor of Education (1969) B.S., Brigham Young University, 1954; M.A., Los Angeles State College, 1957; Ed.D., Brigham Young University, 1963.
<b>Hoover W. Clark</b>	Associate Professor of French (1964) B.A., M.A., Brigham Young University, 1954, 1958; Ph.D., Syracuse University, 1964.
<b>J. Reuben Clark III</b>	Professor of French and Classical Languages (1941) B.A., University of Utah, 1934.
<b>James R. Clark</b>	Professor of Religious Instruction (1938) B.A., M.A., Brigham Young University, 1936, 1944; Ed.D., Utah State University, 1958.
<b>Marden J. Clark</b>	Professor of English (1949) B.A., M.A., Brigham Young University, 1948, 1949; Ph.D., University of Washington, 1957.
<b>Wayne W. Clark</b>	Professor of Economics (1962) B.A., Brigham Young University, 1952; Ph.D., Texas A&M, 1960.
<b>A. John Clarke</b>	Professor of Education (1938) B.S., M.S., Brigham Young University, 1938, 1942; Ed.D., Colorado University, 1950.
<b>John C. Clegg</b>	Professor of Electrical Engineering (1961) B.S., M.S., Ph.D., University of Utah, 1949, 1954, 1957.
<b>Morris M. Clinger</b>	Professor of Speech (1936) B.A., M.A., Brigham Young University, 1932, 1946; Ph.D., University of Minnesota, 1963.
<b>Coran L. Cluff</b>	Associate Professor of Chemistry (1960) B.S., Arizona State University, 1952; M.S., Ph.D., University of Michigan, 1955, 1960.
<b>Ralph Lee Coates</b>	Associate Professor of Chemical Engineering (1967) B.S., Ph.D., University of Utah, 1959, 1962; Registered Professional Engineer, Utah, 1968.
<b>Lane A. Compton</b>	Professor of Physical Science Education (1953) B.S., M.S., Ed.D., University of Utah, 1943, 1951, 1955.
<b>Merlin D. Compton</b>	Professor of Spanish (1964) B.A., M.A., Brigham Young University, 1952, 1954; Ph.D., University of California at Los Angeles, 1959.
<b>Spencer J. Condie</b>	Assistant Professor of Sociology (1969) B.A., Brigham Young University, 1964; M.A., University of Utah, 1965; Ph.D., University of Pittsburgh, 1969.
<b>Leslie Muir Cooper</b>	Associate Professor of Psychology (1966) B.S., M.S., Brigham Young University, 1954, 1955; Ph.D., University of Illinois, 1962.
<b>Ivan L. Corbridge</b>	Professor of Agricultural Economics (1952) B.A., Utah State University, 1946; M.S., University of Chicago, 1948; Ph.D., Washington State College, 1952.
<b>Milford C. Cottrell</b>	Associate Professor of Secondary Education (1964) B.A., University of Wyoming, 1948; M.S., Ed.D., Brigham Young University, 1956, 1961.

<b>Richard O. Cowan</b>	Associate Professor of History of Religion (1961) B.A., Occidental College, 1958; M.A., Ph.D., Stanford University, 1959, 1961.
<b>Soren F. Cox</b>	Associate Professor of English (1955) B.A. M.A., Brigham Young University, 1952, 1956; Ph.D., University of Minnesota, 1964.
<b>Richard H. Cracraft</b>	Assistant Professor of English (1963) B.A., M.A., University of Utah, 1961, 1963; Ph.D., University of Wisconsin, 1970.
<b>Marshall R. Craig</b>	Professor of English (1953) B.S., Brigham Young University, 1941; M.A., Ph.D., Columbia University, 1947, 1968.
<b>Wesley W. Craig</b>	Associate Professor of Sociology (1967) B.A., Brigham Young University, 1956; Ph.D., Cornell University, 1967.
<b>John M. Crandall, Jr.</b>	Associate Professor of Education (1970) B.A., M.A., Arizona State University, 1951, 1957; Ph.D., University of Texas, 1966.
<b>Earl C. Crockett</b>	Professor of Economics (1957) B.S., University of Utah, 1927; Ph.D., University of California, 1931.
<b>Bert P. Cundick</b>	Associate Professor of Psychology (1962) B.A., M.S., University of Utah, 1957, 1959; Ph.D., Ohio State University, 1962.
<b>Beverly R. Cutler</b>	Associate Professor of Education (1969) B.A., University of Utah, 1952; M.S., Brigham Young University, 1963; Ph.D., Stanford University, 1966.
<b>Virginia F. Cutler</b>	Distinguished Professor of Family Economics and Home Management (1961) B.S., University of Utah, 1926; M.A., Stanford University, 1937; Ph.D., Cornell University, 1946.
<b>Delva Daines</b>	Professor of Elementary Education (1955) B.S., M.S., Utah State University, 1940, 1947; Ed.D., Washington State University, 1956.
<b>Robert H. Daines</b>	Associate Professor of Business Management (1959) B.S., Utah State University, 1956; MBA, Stanford University, 1959; DBA, Indiana University, 1966.
<b>Nelson Kent Dalley</b>	Assistant Professor of Chemistry (1969) B.S., M.A., Brigham Young University, 1960, 1964; Ph.D., University of Texas, 1968.
<b>Philip B. Daniels</b>	Associate Professor of Psychology (1961) B.S., M.S., Brigham Young University, 1954, 1957; Ph.D., Harvard University, 1962.
<b>Alexander B. Darais</b>	Associate Professor of Art (1954) B.S., Brigham Young University, 1948; MFA, Claremont Graduate School, 1952.
<b>J. Kenneth Davies</b>	Professor of Economics (1953) B.S., Marquette University, 1945; M.S., Brigham Young University, 1950; Ph.D., University of Southern California, 1959.
<b>D. Evan Davis</b>	Professor of Music (1964) B.A., University of California at Los Angeles, 1946; M. Mus., Northwestern University, 1948; Ed.D., University of Oregon, 1953.
<b>Garold Neil Davis</b>	Associate Professor of Germanic and Slavic Languages (1968) B.A., M.A., Brigham Young University, 1958, 1959; Ph.D., Johns Hopkins University, 1962.
<b>C. Edwin Dean</b>	Associate Professor of Computer Science (1949) B.S., M.S., Brigham Young University, 1947, 1952; M.S., University of Michigan, 1955.
<b>Daniel L. Decker</b>	Professor of Physics (1958) B.S., M.S., Brigham Young University, 1953, 1955; Ph.D., University of Illinois, 1958.
<b>Arturo De Hoyos</b>	Associate Professor of Sociology (1968) B.A., M.A., Brigham Young University, 1952, 1954; Ph.D., Michigan State University, 1961.
<b>Benjamin F. De Hoyos</b>	Assistant Professor of Recreation Education (1961) B.S., M.A., Brigham Young University, 1956, 1961; Ph.D., University of Utah, 1969.
<b>William E. Dibble</b>	Professor of Physics (1961) B.S., Ph.D., California Institute of Technology, 1954, 1960.
<b>Dwight R. Dixon</b>	Professor of Physics (1961) B.S., Utah State University, 1942; Ph.D., University of California, 1955.
<b>Lucile L. Domigan</b>	Associate Professor of Clothing and Textiles (1967) B.S., Brigham Young University, 1940; M.S., Utah State University, 1956; Ph.D., Texas Woman's University, 1959.
<b>David M. Donaldson</b>	Professor of Microbiology (1955) B.S., M.S., Ph.D., University of Utah, 1950, 1952, 1954.

<b>Arthur A. Done</b>	Associate Professor of Business Management (1961)
B.S., MBA, University of Utah, 1955, 1956; Ph.D., University of Illinois, 1963.	
<b>G. Byron Done</b>	Professor of Scripture (1956)
B.A., University of Utah, 1928; M.A., Ph.D., University of Southern California, 1937, 1939.	
<b>Harold Lowe Dowdle</b>	Professor of Spanish and Portuguese (1968)
B.A., M.A., Brigham Young University, 1948, 1949; Ph.D., Stanford University, 1954.	
<b>Lester N. Downing</b>	Professor of Educational Psychology (1954)
B.S., M.S., Utah State University, 1947, 1949; Ed.D., Colorado State College of Education, 1951.	
<b>Roy W. Doxey</b>	Professor of Scripture; Assistant Dean, College of Religious Instruction (1948)
B.A., M.A., George Washington University, 1938, 1940.	
<b>Willard B. Doxey</b>	Professor of Economics (1956)
B.S., M.S., University of Utah, 1937, 1947; Ph.D., University of California at Berkeley, 1956.	
<b>J. Duane Dudley</b>	Professor of Physics (1956)
B.S., Brigham Young University, 1952; M.A., Rice Institute, 1953; Ph.D., University of Utah, 1959.	
<b>James T. Duke</b>	Associate Professor of Sociology (1963)
B.A., M.A., University of Utah, 1957, 1958; Ph.D., University of California at Los Angeles, 1963.	
<b>James Webb Dunn</b>	Assistant Professor of Education (1970)
B.S., M.S., Ed.D., Brigham Young University, 1950, 1960, 1968.	
<b>S. Olani Durrant</b>	Assistant Professor of Civil Engineering (1970)
B.S., M.S., Brigham Young University, 1962, 1963; Sc.D., New Mexico State University, 1969.	
<b>Dean S. Dutton</b>	Assistant Professor of Economics (1968)
B.A., University of Utah, 1964; M.A., Ph.D., Michigan State, 1966, 1968.	
<b>William G. Dyer</b>	Professor of Sociology (1955)
B.A., M.A., Brigham Young University, 1950, 1952; Ph.D., University of Wisconsin, 1955.	
<b>L. Brent Eagar</b>	Associate Professor of Business Management (1959)
BSEE, University of Utah, 1957; MBA, University of Michigan, 1959; DBA, University of Washington, 1965.	
<b>Don L. Earl</b>	Professor of Music (1946)
B.A., M.A., Brigham Young University, 1940, 1947; Ph.D., Indiana University, 1952.	
<b>E. John Eastmond</b>	Professor of Physics (1951)
B.A., Brigham Young University, 1937; Ph.D., University of California at Berkeley, 1943.	
<b>Richard Grant Ellsworth</b>	Associate Professor of English (1958)
B.A., M.A., Brigham Young University, 1951, 1952; Ph.D., University of Maryland, 1958.	
<b>Glenn L. Enke</b>	Professor of Civil Engineering (1962)
B.S., University of California, 1928; Registered Engineer, California, 1934, Utah, 1947, Ohio, 1964, Wyoming, 1965; Registered Land Surveyor, Utah, 1955.	
<b>Ross S. Espin</b>	Assistant Professor of English (1964)
B.A., M.A., Brigham Young University, 1947, 1949; Ph.D., University of Utah, 1970.	
<b>David L. Evans</b>	Associate Professor of English (1954)
B.A., Idaho State College, 1948; M.A., Ph.D., University of Utah, 1953, 1968.	
<b>William E. Evenson</b>	Assistant Professor of Physics (1970)
B.S., Brigham Young University, 1965; Ph.D., Iowa State University, 1968.	
<b>LeRoy G. Faerber</b>	Associate Professor of Business Management (1965)
B.S., MBA, University of Utah, 1958, 1959; DBA, University of Washington, 1964.	
<b>James L. Farmer</b>	Assistant Professor of Zoology (1968)
B.S., California Institute of Technology, 1960; Ph.D., Brown University, 1966.	
<b>Dean B. Farnsworth</b>	Professor of English (1953)
B.A., M.A., University of Utah, 1946, 1947; Ph.D., University of California at Berkeley, 1950.	
<b>Lee W. Farnsworth</b>	Associate Professor of Political Science (1964)
B.A., M.A., University of California at Berkeley, 1957, 1960; Ph.D., Claremont Graduate School, 1963.	
<b>Raymond B. Farnsworth</b>	Professor of Agronomy (1946)
B.S., Brigham Young University, 1937; M.S., Massachusetts State College, 1938; Ph.D., Ohio State University, 1941.	

- J. Earl Faulkner** ..... Associate Professor of Statistics (1963)  
B.S., Utah State University, 1950; M.S., Kansas State University, 1952; Ph.D., University of Minnesota, 1964.
- Lawrence Fearnley** ..... Professor of Mathematics (1957)  
B.S., London University, 1953; Ph.D., University of Utah, 1959.
- D. Allan Firmage** ..... Professor of Civil Engineering (1955)  
BSCE, University of Utah, 1940; M.S., Massachusetts Institute of Technology, 1941; Registered Engineer, Florida, 1948, Utah, 1956.
- A. Garth Fisher** ..... Assistant Professor of Physical Education (1969)  
B.S., Brigham Young University, 1955; M.A., Sacramento State College, 1966; Ph.D., University of New Mexico, 1969.
- Royce P. Flandro** ..... Associate Professor of Secondary Education (1953)  
B.S., M.S., University of Utah, 1948, 1950; Ed.D., University of Indiana, 1957.
- Harvey J. Fletcher** ..... Professor of Mathematics (1953)  
B.S., Massachusetts Institute of Technology, 1944; M.S., California Institute of Technology, 1948; Ph.D., University of Utah, 1954.
- Marvin H. Folsom** ..... Professor of German (1961)  
B.A., M.A., Brigham Young University, 1956, 1957; Ph.D., Cornell University, 1961.
- William E. Fort** ..... Associate Professor of Religious Instruction (1968)  
B.S., Georgia Institute of Technology, 1930; M.A., Ph.D., Duke University, 1932, 1934.
- Glen Ray Foster** ..... Assistant Professor of Economics (1967)  
B.S., Utah State University, 1963; Ph.D., University of Texas, 1970.
- William M. Foxley** ..... Assistant Professor of Music (1969)  
B.M., McCune School of Music, 1954; B.A., Brigham Young University, 1954; MFA, University of Utah, 1955; Ph.D., Brigham Young University, 1969.
- Joseph C. Free** ..... Associate Professor of Mechanical Engineering (1961)  
B.S., Brigham Young University, 1958; M.S., California Institute of Technology, 1961; Ph.D., Massachusetts Institute of Technology, 1967.
- Herbert H. Frost** ..... Professor of Zoology (1960)  
B.A., M.A., Brigham Young University, 1941, 1947; Ph.D., Cornell University, 1955.
- Dean K. Fuhriman** ..... Professor of Civil Engineering (1954)  
B.S., M.S., Utah State University, 1941, 1950; Ph.D., University of Wisconsin, 1952; Registered Professional Engineer, Utah, 1947, Nevada, 1965.
- Darwin Fred Gale** ..... Assistant Professor of Education (1969)  
A.S., Weber State College, 1957; B.S., M.S., Utah State University, 1958, 1960; Ed.D., Brigham Young University, 1967.
- Andrew L. Gardner** ..... Professor of Physics (1964)  
B.S., Utah State University, 1940; Ph.D., University of California at Berkeley, 1955.
- John H. Gardner** ..... Professor of Physics (1949)  
B.S., Utah State University, 1943; M.A., Ph.D., Harvard University, 1947, 1950.
- Robert Wayne Gardner** ..... Associate Professor of Animal Science (1966)  
B.S., Utah State University, 1958; M.S., Ph.D., Cornell University, 1960, 1962.
- Willard Hale Gardner** ..... Associate Professor of Computer Science (1963)  
B.S., Utah State University, 1948; M.S., Brigham Young University, 1956.
- Lynn E. Garner** ..... Assistant Professor of Mathematics (1963)  
B.S., Brigham Young University, 1962; M.A., University of Utah, 1964; Ph.D., University of Oregon, 1968.
- LaMar E. Garrard** ..... Assistant Professor of Philosophy (1968)  
B.S., University of Idaho, 1949; M.S., Ph.D., Brigham Young University, 1955, 1968.
- Ray H. Garrison** ..... Associate Professor of Accounting (1966)  
B.S., M.S., Brigham Young University, 1960, 1961; CPA, Colorado, 1962; DBA, Indiana University, 1966.
- Byron W. Gassman** ..... Professor of English (1960)  
B.A., Brigham Young University, 1955; M.A., Ph.D., University of Chicago, 1956, 1960.
- Burton C. Gee** ..... Associate Professor of Mathematics (1960)  
B.S., Brigham Young University, 1951; M.S., Ed.D., Oregon State University, 1958, 1965.
- J. Douglas Gibb** ..... Assistant Professor of Speech and Dramatic Arts (1969)  
B.S., M.A., University of Utah, 1963, 1964; Ph.D., Wayne State University, 1966.
- Rendol L. Gibbons** ..... Assistant Professor of Music (1954)  
B.A., M.A., Northern Arizona University, 1947, 1954; Ph.D., University of Colorado, 1959.
- M. Carl Gibson** ..... Professor of Spanish (1949)  
B.A., M.A., Brigham Young University, 1947, 1949; Ph.D., University of Oregon, 1960.
- Gurcharan S. Gill** ..... Associate Professor of Mathematics (1960)  
B.S., Brigham Young University, 1958; M.S., Ph.D., University of Utah, 1960, 1965.

<b>Joseph M. Glassett</b>	Associate Professor of Chemical Engineering (1966)
	B.S., University of Utah, 1947; M.S., Massachusetts Institute of Technology, 1948; Registered Professional Engineer, 1956.
<b>Preston R. Gledhill</b>	Professor of Dramatic Arts (1947)
	Degré Supérieur, La Sorbonne, 1938; B.A., Brigham Young University, 1939; M.A., Louisiana State University, 1940; Ph.D., University of Wisconsin, 1951.
<b>J. Rex Goates</b>	Professor of Chemistry (1947)
	B.S., Brigham Young University, 1942; Ph.D., University of Wisconsin, 1947.
<b>A. Harold Goodman</b>	Professor of Music (1960)
	B.A., University of Arizona, 1947; M.Mus., Ed.D., University of Southern California, 1951, 1960.
<b>R. Irwin Goodman</b>	Assistant Professor of Education (1969)
	B.A., University of California at Los Angeles, 1955; M.S., Ed.D., Indiana University, 1961, 1969.
<b>William Dale Goodson</b>	Assistant Professor in Provisional Registration (1965)
	B.S., Ricks College, 1952; M.S., Ed.D., Brigham Young University, 1956, 1969.
<b>Nan Osmond Grass</b>	Associate Professor of English (1951)
	B.A., Brigham Young University, 1930; M.A., Stanford University, 1954.
<b>John A. Green</b>	Professor of French (1964)
	B.A., M.A., Brigham Young University, 1954, 1955; Ph.D., University of Washington, 1960.
<b>Alan H. Grey</b>	Associate Professor of Geography (1964)
	B.A., Brigham Young University, 1959; M.A., Ph.D., University of Wisconsin, 1960, 1963.
<b>Jerry Dee Grover</b>	Associate Professor of Industrial Education (1968)
	B.S., M.S., Utah State University, 1956, 1961; Ed.D., Brigham Young University, 1968.
<b>Stewart L. Grow</b>	Distinguished Professor of History and Political Science (1947)
	B.S., M.S., Brigham Young University, 1935, 1948; Ph.D., University of Utah, 1954.
<b>Clark J. Gubler</b>	Professor of Chemistry (1958)
	B.A., Brigham Young University, 1939; M.A., Utah State University, 1941; Ph.D., University of California, 1945.
<b>Richard L. Gunn</b>	Professor of Art and Education (1948)
	B.S., M.S., Brigham Young University, 1947, 1950; Ed.D., Stanford University, 1955.
<b>Brent Que Hafen</b>	Assistant Professor of Health Science (1969)
	B.E., M.S., University of Utah, 1963, 1965; Ph.D., Southern Illinois University, 1969.
<b>William J. Hafen</b>	Associate Professor of Recreation (1954)
	B.S., Brigham Young University, 1950; M.A., State College of Washington, 1953; D.R., Indiana University, 1960; Ed.D., University of Utah, 1968.
<b>H. Tracy Hall</b>	Distinguished Professor of Chemistry and Chemical Engineering (1955)
	B.S., M.S., Ph.D., University of Utah, 1942, 1943, 1948.
<b>John R. Halliday</b>	Professor of Music (1936)
	B.A., M.A., Brigham Young University, 1935, 1936; Ph.D., Eastman School of Music, University of Rochester, 1941.
<b>W. Kenneth Hamblin</b>	Professor of Geology (1963)
	B.A., M.S., Brigham Young University, 1953, 1954; Ph.D., University of Michigan, 1958.
<b>Richard W. Hanks</b>	Associate Professor of Chemical Engineering (1963)
	B.E., Yale University, 1957; Ph.D., University of Utah, 1960; Registered Professional Engineer, Utah, 1968.
<b>Harold I. Hansen</b>	Professor of Dramatic Arts (1952)
	B.S., Utah State University, 1937; M.A., Ph.D., State University of Iowa, 1940, 1949.
<b>H. Kimball Hansen</b>	Associate Professor of Physics and Astronomy (1963)
	B.S., M.S., Brigham Young University, 1957, 1959; Ph.D., University of California at Berkeley, 1966.
<b>Richard A. Hansen</b>	Associate Professor of Mathematics (1967)
	B.S., M.S., Ph.D., University of Utah, 1959, 1961, 1965.
<b>Terrence L. Hansen</b>	Professor of Spanish; Director, Language Training Mission (1960)
	B.A., University of Utah, 1946; M.A., Ph.D., Stanford University, 1948, 1950.
<b>Kenneth R. Hardy</b>	Professor of Psychology (1954)
	B.A., M.A., University of Utah, 1948, 1949; Ph.D., University of Michigan, 1954.

<b>LeRoy Francis Harlow</b>	Associate Professor of Organization and Management (1967)
B.S., Iowa State University, 1938; M.A., University of Minnesota, 1942.	
<b>Frank W. Harmon</b>	Associate Professor of Elementary Education (1963)
B.S., M.S., University of Utah, 1952, 1956; Ed.D., Columbia University, 1964.	
<b>Callis R. Harms</b>	Associate Professor of Educational Administration (1960)
B.S., M.Ed., Brigham Young University, 1952, 1956; Ed.D., Arizona State University, 1961.	
<b>Edwin O. Haroldsen</b>	Associate Professor of Communications (1969)
B.S., M.S., University of Utah, 1943, 1956; Ph.D., Iowa State University, 1967.	
<b>James M. Harris</b>	Professor of Educational Psychology (1955)
B.S., M.S., Utah State University, 1952, 1953; Ph.D., Cornell University, 1955.	
<b>James Roy Harris</b>	Assistant Professor of Religious Instruction (1966)
B.S., M.A., Ed.D., Brigham Young University, 1952, 1958, 1965.	
<b>John B. Harris</b>	Associate Professor of English (1958)
B.A., M.A., Brigham Young University, 1955, 1956; Ph.D., Wayne State University, 1965.	
<b>John S. Harris</b>	Assistant Professor of English (1962)
B.A., M.A., Brigham Young University, 1953, 1958.	
<b>Bertrand F. Harrison</b>	Professor of Botany (1929)
B.S., M.S., Brigham Young University, 1930, 1931; Ph.D., University of Chicago, 1937.	
<b>B. Kent Harrison</b>	Associate Professor of Physics (1964)
B.S., Brigham Young University, 1955; M.A., Ph.D., Princeton University, 1958, 1959.	
<b>Betty D. Harrison</b>	Associate Professor of Educational Psychology (1961)
B.S., M.S., Ph.D., Brigham Young University, 1959, 1960, 1965.	
<b>Grant Von Harrison</b>	Assistant Professor of Education (1967)
B.A., Brigham Young University, 1962; M.A., Adams State College, 1965; Ed.D., University of California at Los Angeles, 1969.	
<b>Edward L. Hart</b>	Professor of English (1952)
B.S., University of Utah, 1939; M.A., University of Michigan, 1941; Ph.D., Oxford University (England), 1950.	
<b>Leon R. Hartshorn</b>	Associate Professor of Religious Instruction (1965)
B.S., M.S., Brigham Young University, 1956, 1959; Ed.D., Stanford University, 1965.	
<b>Milton F. Hartvigsen</b>	Professor of Physical Education; Dean, College of Physical Education (1956)
B.S., M.Ed., Utah State University, 1930, 1939; Ed.D., University of California at Los Angeles, 1956.	
<b>Dorian Maurice Hatch</b>	Assistant Professor of Physics (1968)
B.S., Utah State University, 1962; M.A., Ph.D., State University of New York at Stony Brook, 1965, 1968.	
<b>Richard T. Hawkins</b>	Professor of Chemistry (1959)
B.A., Brigham Young University, 1951; Ph.D., University of Illinois, 1959.	
<b>Billy Ray Hays</b>	Assistant Professor of Computer Science (1970)
B.S., East Texas State University, 1963; M.S., University of Iowa, 1967; Ph.D., Northwestern University, 1970.	
<b>Richard Allyn Heaps</b>	Assistant Professor of Education (1970)
B.S., Brigham Young University, 1966; M.A., Ph.D., University of Utah, 1968, 1970.	
<b>Howard S. Heaton</b>	Associate Professor of Mechanical Engineering (1963)
B.S., University of Southern California, 1957; M.S., Ph.D., Stanford University, 1959, 1963.	
<b>Israel C. Heaton</b>	Professor of Recreation Education (1956)
B.S., M.S., Utah State University, 1940, 1941; Re.D., University of Indiana, 1955.	
<b>Steven Warner Heiner</b>	Assistant Professor of Health Science (1969)
B.S., M.S., Ed.D., University of Utah, 1955, 1962, 1969.	
<b>Leland J. Hendrix</b>	Assistant Professor of Education (1967)
B.S., M.A., Ph.D., Brigham Young University, 1960, 1966, 1967.	
<b>Richard Wilford Heninger</b>	Associate Professor of Zoology (1966)
B.S., Brigham Young University, 1957; M.S., Ph.D., Oklahoma State University, 1959, 1961.	
<b>Wayne R. Herlin</b>	Assistant Professor of Guided Studies (1964)
B.A., University of Utah, 1953; M.A., Stanford, 1956; Ph.D., University of Utah, 1963.	
<b>Wilford M. Hess</b>	Associate Professor of Botany (1962)
B.S., Brigham Young University, 1957; M.S., Ph.D., Oregon State University, 1960, 1962.	

<b>Jean-Pierre Heudier</b>	Assistant Professor of French and Italian (1960) B.A., Montana State University, 1957; M.A., Brigham Young University, 1960; Ph.D., University of Colorado, 1970.
<b>Martin B. Hickman</b>	Professor of Political Science; Dean, College of Social Sciences (1967) B.S., M.A., Ph.D., University of Utah, 1951, 1952, 1954; MPA, Harvard University, 1960.
<b>Kenneth L. Higbee</b>	Assistant Professor of Psychology (1970) B.S., M.S., Brigham Young University, 1965, 1966; Ph.D., Purdue University, 1970.
<b>John C. Higgins</b>	Associate Professor of Mathematics (1961) B.A., M.A., Brigham Young University, 1958, 1960; Ph.D., University of California at Davis, 1966.
<b>Armin J. Hill</b>	Professor of Physics; Dean, College of Physical and Engineering Sciences (1957) B.S., M.S., Montana State College, 1932, 1938; M.S., Ph.D., California Institute of Technology, 1949, 1950.
<b>Marvin S. Hill</b>	Assistant Professor of History (1968) B.A., M.A., Brigham Young University, 1955; Ph.D., University of Chicago, 1968.
<b>Max W. Hill</b>	Professor of Physics (1958) B.A., Brigham Young University, 1954; Ph.D., University of California at Berkeley, 1959.
<b>Kenneth L. Hillam</b>	Professor of Mathematics (1957) B.S., M.S., University of Utah, 1949, 1956; Ph.D., University of Colorado, 1962.
<b>Ray C. Hillam</b>	Professor of Political Science (1960) B.A., University of Utah, 1955; M.A., George Washington University, 1958; Ph.D., American University, 1964.
<b>H. Gill Hilton</b>	Associate Professor of Statistics (1962) B.S., Brigham Young University, 1957; M.S., Ph.D., North Carolina State College, 1960, 1962.
<b>Edwin C. Hinckley</b>	Professor of Industrial Education (1963) B.S., M.S., Oregon State University, 1950, 1956; Ed.D., Colorado State College, 1963.
<b>Lehi F. Hintze</b>	Professor of Geology (1955) B.A., University of Utah, 1941; M.A., Ph.D., Columbia University, 1949, 1951.
<b>Leona Holbrook</b>	Professor of Physical Education (1937) B.S., University of Utah, 1929; M.A., Ed.D., Columbia University, 1935, 1950.
<b>Lyal E. Holder</b>	Associate Professor of Education (1966) B.S., Brigham Young University, 1951; M.A., Ed.D., Colorado State College, 1958, 1962.
<b>Keith H. Hoopes</b>	Professor of Animal Science (1957) B.S., Utah State University, 1957; DVM, State College of Washington, 1956.
<b>Margaret H. Hoopes</b>	Assistant Professor of Child Development and Family Relationships (1970) B.S., Ricks College, 1953; M.S., Brigham Young University, 1962; Ph.D., University of Minnesota, 1969.
<b>A. Burt Horsley</b>	Professor of Philosophy and Religion (1956) B.A., M.A., Brigham Young University, 1945, 1954; Dd.P., Münster University, 1955; Ph.D., Westphalian Welhelms Universität, Münster, Germany, 1956.
<b>M. Duane Horton</b>	Associate Professor of Chemical Engineering (1963) B.S., Ph.D., University of Utah, 1957, 1961.
<b>William A. Hoskisson</b>	Associate Professor of Microbiology (1957) B.S., M.S., Utah State University, 1938, 1941; Ph.D., University of Illinois, 1944.
<b>Robert J. Howell</b>	Professor of Psychology (1952) B.A., M.A., Ph.D., University of Utah, 1948, 1949, 1951.
<b>Ernest D. Hubbard</b>	Associate Professor of Accounting (1963) B.S., Utah State University, 1952; MBA, University of Utah, 1959; DBA, University of Washington, 1968.
<b>Lloyd Eugene Hudman</b>	Assistant Professor of Geography (1970) B.S., University of Utah, 1964; M.S., Ph.D., Clark University, 1970.
<b>DeVerl S. Humphreys</b>	Associate Professor of Electrical Engineering (1964) B.S., Brigham Young University, 1955; M.S., University of Utah, 1957; Ph.D., University of Illinois, 1963.
<b>O. Glade Hunsaker</b>	Assistant Professor of English (1964) B.S., Utah State University, 1962; M.A., Brigham Young University, 1964; Ph.D., University of Illinois, 1970.
<b>Norman Frederick Hyatt</b>	Associate Professor of Education (1970) B.S., M.S., Brigham Young University, 1948, 1949; Ed.D., University of Oregon, 1964.

<b>Paul V. Hyer</b>	Professor of History (1957)
B.A., Brigham Young University, 1951; M.A., Ph.D., University of California, 1953, 1960.	
<b>Carlton A. Infanger</b>	Associate Professor of Agricultural Economics (1965)
B.S., M.S., Ph.D., Montana State College, 1955, 1956, 1964.	
<b>Reed M. Izatt</b>	Professor of Chemistry (1956)
B.S., Utah State University, 1951; Ph.D., Pennsylvania State University, 1954.	
<b>Richard H. Jackson</b>	Assistant Professor of Geography (1969)
B.S., M.S., Brigham Young University, 1965, 1966; Ph.D., Clark University, 1970.	
<b>Thomas Wendell Jackson</b>	Assistant Professor of Spanish and Portuguese (1968)
B.A., Brigham Young University, 1956; Ph.D., Ohio State University, 1968.	
<b>Briant S. Jacobs</b>	Professor of English (1946)
B.A., Brigham Young University, 1939; Ph.D., State University of Iowa, 1944.	
<b>Cecil B. Jacobson</b>	Professor of Civil Engineering (1970)
B.S., University of Utah, 1932; M.S., University of Illinois, 1941; Registered Engineer and Land Surveyor, Utah, 1936.	
<b>M. Wells Jakeman</b>	Professor of Archaeology and Anthropology (1946)
B.A., University of Utah, 1931; M.A., University of Southern California, 1932; Ph.D., University of California, 1938.	
<b>Ronald D. Jamison</b>	Associate Professor of Mathematics (1963)
B.S., Brigham Young University, 1957; Ph.D., University of Utah, 1965.	
<b>Boyd O. Jarman</b>	Associate Professor of Physical Education (1969)
B.S., Brigham Young University, 1954; M.S., Ed.D., University of Oregon, 1959, 1965.	
<b>August W. Jaussi</b>	Associate Professor of Zoology (1962)
B.S., University of Idaho, 1953; M.S., Brigham Young University, 1955; Ph.D., Oklahoma State University, 1960.	
<b>Clayne R. Jensen</b>	Professor of Physical Education and Recreation Education; Assistant Dean, College of Physical Education (1964)
B.S., M.S., University of Utah, 1952, 1956; PED, Indiana University, 1963.	
<b>De Lamar Jensen</b>	Professor of History (1957)
B.A., Brigham Young University, 1952; M.A., Ph.D., Columbia University, 1953, 1957.	
<b>Gary L. Jensen</b>	Associate Professor of Physics (1966)
B.S., Utah State University, 1958; M.S., Ph.D., University of Michigan, 1960, 1964.	
<b>Larry C. Jensen</b>	Associate Professor of Psychology (1965)
B.S., M.S., Brigham Young University, 1960, 1961; Ph.D., Michigan State University, 1966.	
<b>Marcus M. Jensen</b>	Associate Professor of Microbiology (1969)
B.S., M.S., Utah State University, 1952, 1954; Ph.D., University of California at Los Angeles, 1961.	
<b>Reed J. Jensen</b>	Assistant Professor of Chemistry (1967)
B.A., Ph.D., Brigham Young University, 1960, 1965.	
<b>Vern H. Jensen</b>	Professor of Educational Psychology; Director of Counseling Center (1949)
B.S., M.S., Brigham Young University, 1948, 1950; Ed.D., University of Colorado, 1957.	
<b>Ernest C. Jeppesen</b>	Professor of Industrial Education; Dean, College of Industrial and Technical Education (1959)
B.S., Utah State University, 1926; M.S., Colorado State University, 1938.	
<b>Eldred A. Johnson</b>	Professor of Accounting (1955)
B.A., M.A., Brigham Young University, 1949, 1950; CPA, State of California, 1952; Ph.D., University of Utah, 1968.	
<b>H. Thayne Johnson</b>	Associate Professor of Library and Information Sciences (1965)
B.A., M.A., Brigham Young University, 1950, 1952; M.S., University of Southern California, 1959.	
<b>John Hal Johnson</b>	Assistant Professor of Food Science and Nutrition (1969)
B.S., M.S., Brigham Young University, 1955, 1957; Ph.D., Ohio State University, 1963.	
<b>LaVon C. Johnson</b>	Associate Professor of Physical Education (1969)
B.A., Brigham Young University, 1957; M.A., Ph.D., University of Utah, 1959, 1967.	
<b>Lynn E. Johnson</b>	Assistant Professor of Psychology; Director, Educational Information and Guidance Center (1961)
B.A., Brigham Young University, 1958; M.A., Ph.D., University of Utah, 1959, 1962.	

- Douglas E. Jones** ..... Associate Professor of Physics (1964)  
B.S., M.S., Ph.D., Brigham Young University, 1957, 1959, 1964.
- J. Richard Jones** ..... Assistant Professor of Physical Education for Men (1961)  
B.S., M.S., Brigham Young University, 1951, 1955; Ed.D., Colorado State College, 1967.
- Jens J. Jonsson** ..... Professor of Electrical Engineering (1953)  
BSGE, BSEE, University of Utah, 1944, 1947; MSEE, Ph.D., Purdue University, 1948, 1951.
- Clive D. Jorgensen** ..... Associate Professor of Zoology (1963)  
B.S., M.S., Brigham Young University, 1954, 1957; Ph.D., Oregon State University, 1964.
- Eleanor Jorgensen** ..... Associate Professor of Clothing and Textiles (1949)  
B.S., Brigham Young University, 1946; M.S., Kansas State College, 1954; Ph.D., Texas Women's University, 1965.
- Kenneth W. Karren** ..... Associate Professor of Civil Engineering (1965)  
B.S., M.S., University of Utah, 1953, 1961; Ph.D., Cornell University, 1965; Registered Engineer, Utah, 1959.
- Joseph J. Keeler** ..... Associate Professor of Music; University Organist (1935)  
B.S., M.A., Brigham Young University, 1940, 1950.
- Hans-Wilhelm Kelling** ..... Associate Professor of German (1962)  
Abitur, Germany, 1952; B.A., Brigham Young University, 1958; M.A., Ph.D., Stanford University, 1960, 1967.
- Burton C. Kelly** ..... Associate Professor of Educational Psychology;  
Assistant Director of Counseling Center (1962)  
B.S., Idaho State College, 1952; M.S., Brigham Young University, 1955; Ph.D., University of Chicago, 1966.
- Edwin R. Kimball** ..... Professor of Physical Education (1935)  
B.S., Brigham Young University, 1926; M.S., University of Southern California, 1935; Ed.D., University of Oregon, 1955.
- Merl D. Kimball, Jr.** ..... Assistant Professor of French and Italian (1969)  
B.A., M.A., University of Utah, 1953, 1964; Ph.D., Brigham Young University, 1970.
- Hattie M. Knight** ..... Associate Professor of Library and  
Information Sciences; Director, Graduate Department of Library and  
Information Sciences (1941)  
B.S., Brigham Young University, 1941; B.S., University of Denver, 1943; M.S., George Peabody College for Teachers, 1951.
- Elmer M. Knowles** ..... Professor of Child Development and Family  
Relationships (1962)  
B.S., M.S., Utah State University, 1949, 1950; Ph.D., Cornell University, 1952.
- Roland H. Koller II** ..... Assistant Professor of Economics (1969)  
B.S., University of Utah, 1962; M.A., Ph.D., University of Wisconsin, 1968, 1969.
- Philip R. Kunz** ..... Associate Professor of Sociology (1968)  
B.S., M.S., Brigham Young University, 1961, 1962; Ph.D., University of Michigan, 1967.
- L. Gary Lambert** ..... Assistant Professor of French (1969)  
B.A., University of California at Berkeley, 1963; M.A., University of California at Santa Barbara, 1965; Ph.D., Rice University, 1969.
- Neal E. Lambert** ..... Assistant Professor of English (1966)  
B.A., Ph.D., University of Utah, 1961, 1966.
- Jack Wayne Lamoreaux** ..... Assistant Professor of Mathematics (1968)  
B.S., Brigham Young University, 1960; M.S., Ph.D., University of Utah, 1962, 1967.
- Don H. Larsen** ..... Professor of Microbiology (1952)  
B.S., Brigham Young University, 1940; M.A., University of Nebraska, 1942; Ph.D., University of Utah, 1950.
- Kenneth M. Larsen** ..... Associate Professor of Mathematics (1960)  
B.A., University of Utah, 1950; M.A., Brigham Young University, 1956; Ph.D., University of California at Los Angeles, 1964.
- Vernon W. Larsen** ..... Professor of Sociology (1952)  
B.A., M.A., Brigham Young University, 1949, 1950; Ph.D., Cornell University, 1957.
- Clinton F. Larson** ..... Professor of English (1947)  
B.A., M.A., University of Utah, 1943, 1947; Ph.D., University of Denver, 1956.
- E. Gerald Larson** ..... Associate Professor of Physics (1964)  
B.S., M.S., Ph.D., Massachusetts Institute of Technology, 1957, 1959, 1964.
- Duane M. Laws** ..... Associate Professor of Child Development and  
Family Relationships (1963)  
B.A., M.A., Brigham Young University, 1958, 1959; Ed.D., Teachers College at Columbia University, 1964.

<b>W. Derby Laws</b>	Professor of Agronomy (1960)
B.S., Brigham Young University, 1939; M.S., Utah State University, 1941; Ph.D., Ohio State University, 1944.	
<b>Harold R. Laycock</b>	Professor of Music (1949)
B.A., M.A., Brigham Young University, 1937, 1947; DMA, University of Southern California, 1961.	
<b>Ralph G. Laycock</b>	Associate Professor of Music (1953)
B.A., Brigham Young University, 1941; M.S., Juilliard School of Music, N.Y.C., 1948.	
<b>Robert L. Layton</b>	Professor of Geography (1954)
B.S., M.S., University of Utah, 1951, 1952; Ph.D., University of Syracuse, 1962.	
<b>Harold W. Lee</b>	Professor of French (1937)
B.A., M.A., Brigham Young University, 1938, 1940; Ph.D., Stanford University, 1946.	
<b>John T. Longhurst</b>	Assistant Professor of Music (1969)
D.M., University of Utah, 1964; M.M., University of Utah, 1966; DMA, University of Rochester, 1970.	
<b>Ferril A. Losee</b>	Professor of Electrical Engineering (1965)
B.S., University of Utah, 1953; M.S., University of Southern California, 1957.	
<b>Gordon M. Low</b>	Professor of Speech (1964)
B.A., M.S., University of Utah, 1949, 1950; Ph.D., University of Minnesota, 1955.	
<b>Daniel H. Ludlow</b>	Professor of Scripture; Dean, College of Religious Instruction (1955)
B.S., Utah State University, 1946; M.S., Indiana University, 1953; Ed.D., Columbia University, 1955.	
<b>Ross "J" McArthur</b>	Professor of Industrial Education (1956)
B.S., M.S., Utah State University, 1949, 1953; Ed.D., University of Missouri, 1955.	
<b>Myron William McIntyre</b>	Assistant Professor of English (1967)
B.A., Sacramento State College, 1951; M.A., Ph.D., University of California at Berkeley, 1958, 1965.	
<b>William E. McKell</b>	Assistant Professor of Industrial Education (1970)
B.S., Utah State University, 1948; M.E., Texas A&M, 1951; Ed.D., Utah State University, 1967.	
<b>J. Glen McKellar</b>	Assistant Professor of English (1964)
B.A., M.A., Brigham Young University, 1960, 1962; Ph.D., University of Colorado, 1967.	
<b>John E. McKendrick</b>	Associate Professor of English (1953)
B.A., M.A., University of Utah, 1942, 1949.	
<b>Gary Frances McKinnon</b>	Assistant Professor of Business Management (1969)
B.S., MBA, University of Utah, 1962, 1963; Ph.D., University of Texas, 1968.	
<b>Delbert H. McNamara</b>	Professor of Physics (1956)
B.S., Ph.D., University of California at Berkeley, 1947, 1950.	
<b>Melvin P. Mabey</b>	Professor of History and Political Science (1955)
B.S., M.A., Brigham Young University, 1947, 1953; D. Phil., Oxford University (England), 1955.	
<b>Harold S. Madsen</b>	Associate Professor of English (1970)
B.A., M.A., University of Utah, 1953, 1960; Ph.D., University of Colorado, 1965.	
<b>Truman G. Madsen</b>	Professor of Philosophy (1957)
B.S., M.S., University of Utah, 1951, 1952; A.M., Ph.D., Harvard University, 1957, 1960.	
<b>Francis R. Magleby</b>	Associate Professor of Art (1959)
B.S., M.S., Brigham Young University, 1950, 1951.	
<b>Nolan F. Mangelson</b>	Assistant Professor of Chemistry (1969)
B.S., Utah State University, 1961; M.S., Brigham Young University, 1963; Ph.D., University of California at Berkeley, 1967.	
<b>John H. Mangum</b>	Associate Professor of Chemistry (1963)
B.S., M.S., Brigham Young University, 1957, 1959; Ph.D., University of Washington, 1963.	
<b>Robert P. Manookin</b>	Assistant Professor of Music (1959)
B.A., Brigham Young University, 1955; M.Mus., University of Illinois, 1959; Ph.D., University of Utah, 1967.	
<b>Maurice P. Marchant</b>	Assistant Professor of Library and Information Sciences (1969)
B.A., M.S., University of Utah, 1949, 1953; MLS, M.A., Ph.D., University of Michigan, 1966, 1968, 1970.	

<b>H. Carleton Marlow</b>	Associate Professor of History (1964)
B.S., M.S., Brigham Young University, 1958, 1959; Ph.D., University of Oklahoma, 1966.	
<b>Grant W. Mason</b>	Assistant Professor of Physics (1970)
B.A., Brigham Young University, 1961; Ph.D., University of Utah, 1969.	
<b>James A. Mason</b>	Associate Professor of Music (1956)
B.A., M.A., Brigham Young University, 1955, 1957; Ed.D., Arizona State University, 1970.	
<b>Ray T. Matheny</b>	Associate Professor of Anthropology and Archaeology (1964)
B.A., M.A., Brigham Young University, 1960, 1962; Ph.D., University of Oregon, 1968.	
<b>Conan E. Mathews</b>	Professor of Art; Dean Emeritus of the College of Fine Arts and Communications (1956)
B.A., College of Idaho, 1936; MFA, University of Utah, 1950.	
<b>D. Eugene Mead</b>	Associate Professor of Child Development and Family Relationships (1967)
B.A., University of Oregon, 1956; M.A., San Jose State College, 1963; Ph.D., University of Oregon, 1967.	
<b>J. Keith Melville</b>	Professor of Political Science (1957)
B.A., University of Utah, 1947; M.A., University of California, 1956; Ph.D., University of Utah, 1959.	
<b>M. David Merrill</b>	Associate Professor of Education (1966)
B.A., Brigham Young University, 1961; M.A., Ph.D., University of Illinois, 1964.	
<b>LaVere B. Merritt</b>	Assistant Professor of Civil Engineering (1964)
B.S., M.S., University of Utah, 1963, 1965; Ph.D., University of Washington, 1970; Registered Engineer, Washington, 1970.	
<b>Charles L. Metten</b>	Associate Professor of Dramatic Arts (1962)
B.A., M.A., University of California at Los Angeles, 1951, 1952; Ph.D., State University of Iowa, 1960.	
<b>Louis C. Midgley</b>	Associate Professor of Political Science (1963)
B.S., M.S., University of Utah, 1954, 1957; Ph.D., Brown University, 1964.	
<b>Marion T. Millett</b>	Associate Professor of Geography (1958)
B.A., University of Southern California, 1954; M.A., University of Colorado, 1956; Ph.D., McGill University, Canada, 1965.	
<b>Gayle F. Miner</b>	Associate Professor of Electrical Engineering (1960)
B.S., M.S., University of Utah, 1959, 1960; Ph.D., University of California, 1969.	
<b>Albert O. Mitchell</b>	Professor of Dramatic Arts (1956)
B.S., M.S., University of Utah, 1933, 1935; Ph.D., University of Wisconsin, 1938.	
<b>J. Weldon Moffitt</b>	Professor of Psychology (1963)
B.S., Brigham Young University, 1949; M.S., University of Utah, 1950; Ph.D., University of Illinois, 1953.	
<b>Darrel J. Monson</b>	Associate Professor of Electrical Engineering; Director, Instructional Services (1956)
B.S., University of Utah, 1943; M.S., University of California at Berkeley, 1952.	
<b>Harold K. Moon</b>	Associate Professor of Spanish (1963)
B.A., M.A., Brigham Young University, 1957, 1959; Ph.D., Syracuse University, 1963.	
<b>Blaine H. Moore</b>	Assistant Professor of Education (1970)
B.S., M.Ed., Brigham Young University, 1955, 1960; Ed.D., Colorado State College, 1969.	
<b>Glen Moore</b>	Professor of Botany (1958)
B.S., Brigham Young University, 1949; Ph.D., University of Chicago, 1954.	
<b>Hal G. Moore</b>	Associate Professor of Mathematics (1961)
B.S., M.S., University of Utah, 1952, 1957; Ph.D., University of California at Santa Barbara, 1967.	
<b>Alonzo J. Morley</b>	Professor of Speech (1928)
B.A., M.A., Brigham Young University, 1925, 1931; Ph.D., University of Iowa, 1935.	
<b>Edwin B. Morrell</b>	Associate Professor of Political Science (1961)
B.A., Brigham Young University, 1956; M.A., Ph.D., Harvard University, 1959, 1966.	
<b>A. Reed Morrill</b>	Professor of Educational Administration (1948)
B.S., M.S., Brigham Young University, 1928, 1937; Ed.D., University of Oregon, 1948.	
<b>Kay Sherman Mortensen</b>	Assistant Professor of Industrial Technology (1968)
B.S., M.S., Utah State University, 1962, 1963; Ph.D., University of Utah, 1967.	
<b>Darrell L. Moses</b>	Associate Professor of Educational Psychology (1959)
B.A., M.A., University of Utah, 1952, 1953; Ph.D., University of Southern California, 1960.	

<b>J. Joel Moss</b>	Professor of Child Development and Family Relationships (1961)
B.S., M.S., Brigham Young University, 1948, 1949; Ph.D., University of North Carolina, 1954.	
<b>J. Richard Murdock</b>	Professor of Botany (1952)
B.S., M.S., Brigham Young University, 1949, 1951; Ph.D., Washington State University, 1956.	
<b>Joseph R. Murphy</b>	Professor of Zoology (1960)
B.A., M.A., Brigham Young University, 1950, 1951, Ph.D., University of Nebraska, 1957.	
<b>Ivan David Muse</b>	Associate Professor of Education (1970)
B.S., Brigham Young University, 1955; M.Ed., University of Arizona, 1958; D.Ed., University of Utah, 1966.	
<b>Merlin G. Myers</b>	Associate Professor of Anthropology (1963)
B.A., Brigham Young University, 1951; Ph.D., University of Cambridge, 1963.	
<b>Donald K. Nelson</b>	Assistant Professor of Library Science; Director of Library (1961)
B.S., Utah State University, 1938; MBA, University of Denver, 1949.	
<b>George E. Nelson, Jr.</b>	Associate Professor of Business Education (1968)
B.S., M.S., University of Utah, 1965, 1966; Ed.D., Arizona State University, 1968.	
<b>Glen T. Nelson</b>	Professor of Economics (1954)
B.S., M.S., Utah State University, 1942, 1948; Ph.D., University of Illinois, 1950.	
<b>H. Mark Nelson</b>	Professor of Physics (1959)
B.S., M.S., Brigham Young University, 1953, 1954; Ph.D., Harvard University, 1960.	
<b>K. LeRoi Nelson</b>	Professor of Chemistry (1956)
B.S., Utah State University, 1948; Ph.D., Purdue University, 1952.	
<b>Parley W. Newman</b>	Professor of Speech (1966)
B.S., M.S., Utah State University, 1950, 1951; Ph.D., State University of Iowa, 1954.	
<b>Hugh W. Nibley</b>	Professor of History and Religion (1946)
B.A., University of California at Los Angeles, 1934; Ph.D., University of California, 1938.	
<b>Reid Nibley</b>	Professor of Music (1969)
B.F.A., M.A., University of Utah, 1950, 1953; DMA, University of Michigan, 1964.	
<b>Henry J. Nicholes</b>	Professor of Zoology (1946)
B.A., Brigham Young University, 1935; Ph.D., University of Wisconsin, 1941.	
<b>Howard C. Nielson</b>	Professor of Statistics (1957)
B.S., University of Utah, 1947; M.S., University of Oregon, 1949; MBA, Ph.D., Stanford University, 1956, 1957.	
<b>Dale LeRoy Nish</b>	Assistant Professor of Industrial Education (1967)
B.S., M.S., Brigham Young University, 1957, 1958; Ed.D., Washington State University, 1967.	
<b>Quentin R. Nordgren</b>	Professor of Music (1955)
B.A., M.A., Brigham Young University, 1942, 1950; Ph.D., Indiana University, 1955.	
<b>Theodore A. Norman</b>	Assistant Professor of Computer Science (1970)
B.S., University of Utah, 1962; M.S., Washington State University, 1968; Ph.D., Washington State University, 1970.	
<b>James A. North</b>	Associate Professor of Microbiology (1965)
B.S., M.S., Brigham Young University, 1958, 1960; Ph.D., University of Utah, 1964.	
<b>Peter Albert Nyberg</b>	Assistant Professor of Zoology (1968)
B.S., M.S., Utah State University, 1962, 1964; Ph.D., Oregon State University, 1967.	
<b>Monte S. Nyman</b>	Assistant Professor of Religious Instruction (1966)
B.S., M.S., Utah State University, 1952, 1958; Ed.D., Brigham Young University, 1965.	
<b>Clinton L. Oaks</b>	Professor of Business Management (1957)
B.A., Brigham Young University, 1948; MBA, Ph.D., Stanford University, 1950, 1955.	
<b>Harold R. Oaks</b>	Assistant Professor of Speech and Dramatic Arts (1970)
B.A., M.A., Brigham Young University, 1960, 1962; Ph.D., University of Minnesota, 1964.	
<b>Burton K. Olsen</b>	Assistant Professor of Recreation Education (1965)
B.S., M.S., Brigham Young University, 1963, 1964; Ph.D., University of Minnesota, 1969.	
<b>John E. Ord</b>	Associate Professor of Elementary Education (1957)
B.S., Utah State University, 1940; M.S., University of Utah, 1949; Ed.D., Stanford University, 1958.	
<b>Leon Edwin Orme</b>	Professor of Animal Science (1969)
B.S., Utah State University, 1953; M.S., University of Tennessee, 1955; Ph.D., Michigan State University, 1958.	

<b>Bryce B. Orton</b>	Professor of Accounting; Assistant Dean, College of Business (1961)
	B.S., Brigham Young University, 1951; M.B.A., University of Oregon, 1957; D.B.A. University of Washington, 1962.
<b>J. Bevan Ott</b>	Professor of Chemistry (1960)
	B.S., M.S., Brigham Young University, 1955, 1956; Ph.D., University of California, 1959.
<b>Glen F. Ovard</b>	Professor of Educational Administration (1958)
	B.S., M.S., Brigham Young University, 1949, 1954; Ed.D., Stanford University, 1958.
<b>Earl Leroy Overstreet</b>	Assistant Professor of Health Science (1967)
	B.S., Brigham Young University, 1961; M.S., University of Utah, 1964; Ed.D., West Virginia University, 1967.
<b>Russell T. Pack</b>	Assistant Professor of Chemistry (1967)
	B.S., Brigham Young University, 1962; Ph.D., University of Wisconsin, 1967.
<b>Thane J. Packer</b>	Associate Professor of Youth Leadership and Recreation Education (1959)
	B.S., Utah State University, 1939; M.S., Brigham Young University, 1963.
<b>Edna Page</b>	Professor of Food Science and Nutrition (1966)
	B.S., Utah State University, 1934; M.A., Columbia University, 1940; Ph.D., Univer- sity of Wisconsin, 1952.
<b>E. Paul Palmer</b>	Associate Professor of Physics (1966)
	B.A., Ph.D., University of Utah, 1952, 1956.
<b>Spencer J. Palmer</b>	Professor of History of Religion (1962)
	B.A., Brigham Young University, 1952; M.A., Ph.D., University of California at Berkeley, 1959, 1964.
<b>Robert Lynn Park</b>	Associate Professor of Animal Science (1965)
	B.S., Brigham Young University, 1956; M.S., Ph.D., Cornell University, 1958, 1962.
<b>Robert C. Patch</b>	Professor of Scripture (1959)
	B.A., University of Mexico, 1945; M.Th., Ph.D., Brigham Young University, 1949, 1964.
<b>Edward G. Paul</b>	Associate Professor of Chemistry (1964)
	B.S., Ph.D., University of Utah, 1958, 1962.
<b>Ernest B. Paxson, Jr.</b>	Associate Professor of Mechanical Engineering (1969)
	B.A., B.S., Rice University, 1957, 1958; M.S., Ph.D., Stanford University, 1959, 1963.
<b>I. Reed Payne</b>	Associate Professor of Psychology (1964)
	B.S., Brigham Young University, 1956; M.S., Ph.D., Pennsylvania State University, 1958, 1963.
<b>Glenn L. Pearson</b>	Associate Professor of Scripture (1951)
	B.S., Utah State University, 1949; M.A., Brigham Young University, 1951.
<b>Darhl Max Pedersen</b>	Associate Professor of Psychology (1962)
	B.S., M.S., Brigham Young University, 1957, 1958; Ph.D., University of Illinois, 1962.
<b>Devern Jay Perry</b>	Assistant Professor of Business Education (1963)
	B.S., M.S., Brigham Young University, 1958, 1962; Ed.D., University of North Dakota, 1968.
<b>Betty J. Petersen</b>	Associate Professor of Business Education (1963)
	B.S., Utah State University, 1958; M.A., Columbia University, 1960.
<b>Melvin J. Petersen</b>	Associate Professor of Religious Education (1964)
	B.S., M.S., Ed.D., Brigham Young University, 1948, 1955, 1964.
<b>Morris S. Petersen</b>	Associate Professor of Geology (1966)
	B.S., M.S., Brigham Young University, 1955, 1956; Ph.D., University of Iowa, 1962.
<b>Dean A. Peterson</b>	Professor of Business Education; Administrative Assistant to the President; Director of Summer School (1942)
	B.S., Brigham Young University, 1938; M.S., Ed.D., University of Southern Cali- fornia, 1942, 1959.
<b>Evan T. Peterson</b>	Professor of Sociology (1959)
	B.S., M.S., Brigham Young University, 1952, 1953; Ph.D., University of Michigan, 1959.
<b>H. Donl Peterson</b>	Associate Professor of Religious Instruction (1964)
	B.S., M.Ed., Brigham Young University, 1954, 1960; Ed.D., Washington State University, 1965.
<b>John M. Peterson</b>	Associate Professor of Mathematics (1965)
	B.S., M.S., Ed.D., Utah State University, 1961, 1964, 1965.
<b>W. Revell Phillips</b>	Professor of Geology (1957)
	B.S., M.S., Ph.D., University of Utah, 1950, 1951, 1954.

<b>Rex O. Pinegar</b>	Associate Professor of Special Education (1966) B.S., Brigham Young University, 1958; M.A., San Francisco State College, 1962; Ed.D., University of Southern California, 1966.
<b>James Kent Pinney</b>	Associate Professor of Business Management (1967) B.A., University of Utah, 1962; MBA, Indiana University, 1964.
<b>J. Perry Polson</b>	Associate Professor of Business Education (1952) B.S., M.S., University of Utah, 1947, 1952; Ed.D., University of Southern California, 1961.
<b>James H. Polve</b>	Professor of Mechanical Engineering (1969) B.S., University of Utah, 1948; M.S., Princeton University, 1951; Ph.D., University of Arizona, 1966.
<b>Bill J. Pope</b>	Professor of Chemical Engineering (1958) B.S., University of Utah, 1947; M.S., Ph.D., University of Washington, 1948, 1959; Registered Professional Engineer, Utah, 1956.
<b>Karl Theodore Pope</b>	Assistant Professor of Dramatic Arts (1966) B.A., M.A., Brigham Young University, 1962, 1964; Ph.D., Wayne State University, 1966.
<b>Blaine R. Porter</b>	Professor of Child Development and Family Relationships; Dean, College of Family Living (1955) B.S., M.A., Brigham Young University, 1947, 1949; Ph.D., Cornell University, 1952.
<b>Jenniev J. Poulsom</b>	Associate Professor of Family Economics and Home Management (1963) B.S., Brigham Young University, 1933; M.S., Ph.D., Iowa State University, 1954, 1964.
<b>Alvin Harold Price</b>	Associate Professor of Child Development and Family Relationships (1966) B.S., Brigham Young University, 1960; M.A., Ph.D., University of Minnesota, 1963, 1966.
<b>B. Michael Pritchett</b>	Assistant Professor of Economics (1969) B.S., Brigham Young University, 1965; M.S., Purdue University, 1967; Ph.D., Purdue University, 1969.
<b>Louis H. Quackenbush</b>	Assistant Professor of Spanish and Portuguese (1970) B.A., M.A., Brigham Young University, 1965, 1967; Ph.D., University of Illinois, 1970.
<b>David M. Randall</b>	Assistant Professor of Music (1970) B.S., Brigham Young University, 1965; M.M., Indiana University, 1967; DMA, University of Iowa, 1970.
<b>Dennis F. Rasmussen</b>	Assistant Professor of Philosophy (1970) B.S., University of Utah, 1966; M.Ph., Ph.D., Yale University, 1968, 1970.
<b>Ellis T. Rasmussen</b>	Associate Professor of Old Testament Languages and Literature (1951) B.S., M.A., Ph.D., Brigham Young University, 1942, 1951, 1967.
<b>Lynn A. Ravsten</b>	Counselor in Counseling Center; Assistant Professor of Educational Psychology (1957) B.S., Brigham Young University, 1953; M.A., Stanford University, 1956; Ph.D., University of Utah, 1966.
<b>Jesse W. Reeder</b>	Professor of History and Political Science (1952) B.S., M.S., Utah State University, 1934, 1937; Ph.D., Cornell University, 1952.
<b>Howard T. Reid</b>	Professor of Personnel and Guidance (1953) B.A., Brigham Young University, 1940; M.S., Ed.D., University of Southern California, 1947, 1949.
<b>Alvin C. Rencher</b>	Assistant Professor of Statistics (1968) B.S., M.A., Brigham Young University, 1959, 1962; Ph.D., Virginia Polytechnic Institute, 1968.
<b>Noel Beldon Reynolds</b>	Assistant Professor of Philosophy (1970) B.A., Brigham Young University, 1967; M.A., Ph.D., Harvard University, 1968, 1970.
<b>Owen S. Rich</b>	Professor of Communications (Radio-Television) (1950) B.S., Brigham Young University, 1950; M.A., University of Southern California, 1953; Ed.D., Pennsylvania State University, 1963.
<b>Russell R. Rich</b>	Professor of History of Religion (1953) B.S., Utah State University, 1936; M.A., Brigham Young University, 1949; Ed.D., University of Wyoming, 1955.
<b>Dale O. Richards</b>	Professor of Statistics (1963) B.S., Utah State University, 1950; M.S., Ph.D., Iowa State University, 1957, 1963.
<b>J. Morris Richards</b>	Associate Professor of Communications (1965) B.A., Arizona State College, 1929; M.A., University of Arizona, 1937.

## ADMINISTRATION AND FACULTY

<b>Dean Rickenbach</b>	Associate Professor of Economics (1963)
B.S., Brigham Young University, 1954; M.S., Stanford University, 1957; Ph.D., Indiana University, 1963.	
<b>Chauncey C. Riddle</b>	Professor of Philosophy;
B.S., Brigham Young University, 1947; M.A., Ph.D., Columbia University, 1951, 1958.	Dean, the Graduate School (1952)
<b>J. Keith Rigby</b>	Professor of Geology (1953)
B.S., M.S., Brigham Young University, 1948, 1949; Ph.D., Columbia University, 1952.	
<b>Burton W. Robinson</b>	Professor of Clinical Psychology (1955)
B.S., M.S., Utah State University, 1951; Ph.D., Purdue University, 1954.	
<b>Donald W. Robinson</b>	Professor of Mathematics (1956)
B.S., M.A., University of Utah, 1948, 1952; Ph.D., Case Institute of Technology, 1956.	
<b>R. Max Rogers</b>	Professor of German; Assistant Dean,
B.A., M.A., Brigham Young University, 1940, 1942; Ph.D., Stanford University, 1951.	College of Humanities (1945)
<b>Thomas F. Rogers</b>	Associate Professor of Germanic and Slavic Languages (1969)
B.A., University of Utah, 1955; M.A., Yale University, 1962; Ph.D., Georgetown University, 1968.	
<b>Vern C. Rogers</b>	Assistant Professor of Chemical Engineering (1969)
B.S., M.S., University of Utah, 1965; Ph.D., Massachusetts Institute of Technology, 1968.	
<b>Norma Rohde</b>	Associate Professor of Educational Psychology;
B.A., University of Utah, 1949; M.A., Columbia University, 1958; Ed.D., Brigham Young University, 1965.	Counselor in Counseling Center (1965)
<b>Boyd C. Rollins</b>	Associate Professor of Child Development and Family Relationships (1963)
B.S., Utah State University, 1953; M.S., Brigham Young University, 1958; Ph.D., Cornell University, 1961.	
<b>Ralph L. Rollins</b>	Professor of Civil Engineering (1956)
B.S., M.S., Utah State University, 1941, 1949; Ph.D., Iowa State University, 1954; Registered Engineer, Utah, 1958, Nevada, 1967.	
<b>Antone K. Romney</b>	Distinguished Professor of Comparative Education;
B.S., M.S., Brigham Young University, 1933, 1934; Ed.D., Stanford University, 1947.	Dean Emeritus, College of Education (1945)
<b>Keith Leroy Roos</b>	Assistant Professor of German (1968)
B.A., University of Utah, 1964; Ph.D., Rice University, 1968.	
<b>Harold E. Rosen</b>	Associate Professor of Spanish (1966)
B.A., M.A., Brigham Young University, 1954, 1959; Ph.D., University of Oregon, 1966.	
<b>Elmo S. Roundy</b>	Professor of Physical Education (1963)
B.S., M.Ed., Brigham Young University, 1953, 1956; Ed.D., University of California at Los Angeles, 1965.	
<b>Samuel R. Rushforth</b>	Assistant Professor of Botany and Range Science (1970)
B.S., Weber State College, 1966; M.S., Ph.D., Brigham Young University, 1968, 1970.	
<b>Richard D. Sagers</b>	Professor of Microbiology (1958)
B.S., M.S., Brigham Young University, 1954, 1955; Ph.D., University of Illinois, 1958.	
<b>Clyde D. Sandgren</b>	Vice-President and General Counsel; Professor of Political Science (1954)
B.S., Brigham Young University, 1937; LL.B., J.D., St. John's University, 1939, 1968.	
<b>Lawrence W. Sardoni</b>	Professor of Music (1945)
B.A., M.A., Brigham Young University, 1935, 1946	
<b>Richard Schmutz</b>	Associate Professor of History (1966)
B.A., San Fernando State College, 1960; Ph.D., University of Southern California, 1966.	
<b>Lynn Scoresby</b>	Assistant Professor of Child Development and Family Relationships (1970)
B.S., M.A., Brigham Young University, 1965, 1966; Ph.D., University of Minnesota, 1969.	
<b>John F. A. Seggar</b>	Associate Professor of Sociology (1966)
B.S., Brigham Young University, 1962; M.A., Ph.D., University of Kentucky, 1964, 1968.	
<b>Donald D. Shaw</b>	Professor of Health Sciences and Recreation Education (1959)
B.A., M.S., Brigham Young University, 1957, 1961; Ed.D., Oregon State University, 1965.	

- Lyman Sidney Shreeve, Sr.** ..... Associate Professor of Spanish and Portuguese (1970)  
B.A., M.A., Brigham Young University, 1949, 1950; Ph.D., Interamerican University, 1970.
- R. Phil Shumway** ..... Professor of Animal Science (1949)  
B.S., Utah State University, 1947; M.S., University of Minnesota, 1949; Ph.D., Utah State University, 1959.
- R. Wayne Shute** ..... Assistant Professor of Education; Coordinator of Community Education, Division of Continuing Education (1960)  
B.S., M.Ed., Brigham Young University, 1955, 1959; Ed.D., University of Southern California, 1964.
- Val Eugene Simmons** ..... Assistant Professor of Industrial Technology (1960)  
B.S., University of Utah, 1964; M.S., Brigham Young University, 1966; Ph.D., Utah State University, 1968.
- John M. Simonsen** ..... Professor of Mechanical Engineering (1954)  
BSME, University of Utah, 1950; MSME, Ph.D., Purdue University, 1952, 1955; Registered Professional Engineer, Utah, 1957.
- Ralph Vencil Skarda, Jr.** ..... Associate Professor of Mathematics (1965)  
B.A., Pomona College, 1961; M.S., Ph.D., California Institute of Technology, 1964, 1965.
- Karl M. Skousen** ..... Professor of Accounting (1958)  
B.S., M.S., Brigham Young University, 1944, 1957; CPA, Utah, 1957; Ph.D., Michigan State University, 1962.
- K. Fred Skousen** ..... Associate Professor of Accounting (1970)  
B.S., Brigham Young University, 1965; MAS, Ph.D., University of Illinois, 1966, 1968; CPA, Utah, 1968.
- Robert H. Slover** ..... Associate Professor of Political Science (1965)  
B.A., University of Oklahoma, 1935; M.A., Ph.D., Harvard University, 1948, 1950.
- Gary Richard Smith** ..... Associate Professor of Business Education (1969)  
B.A., M.A., Idaho State University, 1954, 1959; Ed.D., University of Idaho, 1969.
- Harold T. Smith** ..... Assistant Professor of Business Education (1963)  
B.A., M.A., Colorado State College, 1958, 1959; Ed.D., Brigham Young University, 1967.
- Howard Duane Smith** ..... Assistant Professor of Zoology (1969)  
B.S., M.S., Brigham Young University, 1963, 1966; Ph.D., University of Illinois, 1969.
- Jay M. Smith** ..... Professor of Accounting (1971)  
B.S., M.S., Brigham Young University, 1953, 1960; CPA, 1953; Ph.D., Stanford University, 1965.
- Kay H. Smith** ..... Associate Professor of Psychology (1961)  
B.A., M.A., Brigham Young University, 1957, 1958; Ph.D., Wayne State University, 1962.
- LaMont Wood Smith** ..... Assistant Professor of Animal Science (1970)  
B.S., Brigham Young University, 1960; M.S., University of Wisconsin, 1962; Ph.D., West Virginia University, 1970.
- Marvin A. Smith** ..... Associate Professor of Chemistry (1966)  
B.S., Utah State University, 1960; M.S., Ph.D., University of Wisconsin, 1962, 1966.
- Murray F. Smith** ..... Associate Professor of German (1967)  
B.A., University of Utah, 1956; M.S., Ph.D., University of Southern California, 1961, 1967.
- Oliver R. Smith** ..... Professor of Communications (1938)  
B.A., Brigham Young University, 1938; Ph.D., State University of Iowa, 1951.
- Ralph B. Smith** ..... Professor of Education (1963)  
B.S., Brigham Young University, 1943; M.A., University of Southern California, 1947; Ed.D., Brigham Young University, 1962.
- Robert J. Smith** ..... Professor of Accounting; Associate Academic Vice-President (1949)  
B.S., Brigham Young University, 1948; MBA, Northwestern University, 1949; CPA, Illinois, 1949; CPA, Utah, 1950; DBA, Indiana University, 1957.
- Wilford E. Smith** ..... Professor of Sociology (1948)  
B.A., University of Utah, 1943; M.A., Brigham Young University, 1948; Ph.D., University of Washington, 1952.
- Leon Douglas Smoot** ..... Professor of Chemical Engineering (1967)  
B.S., Brigham Young University, 1957; M.S., Ph.D., University of Washington, 1958, 1960; Registered Professional Engineer, Utah, 1963.
- Donald Ray Snow** ..... Associate Professor of Mathematics (1969)  
B.A., BSME, University of Utah, 1959; MSME, M.S., Ph.D., Stanford University, 1960, 1962, 1965.

- G. Gardner Snow** ..... Associate Professor of Education (1969)  
B.S., M.Ed., Brigham Young University, 1950, 1959; Ph.D., Michigan State University, 1969.
- Karl Nelson Snow, Jr.** ..... Associate Professor of Political Science; Director, Institute of Government Service (1969)  
B.S., Brigham Young University, 1956; M.A., University of Minnesota, 1958; MPA, University of Southern California, 1965.
- Richard L. Snow** ..... Professor of Chemistry (1957)  
B.S., Ph.D., University of Utah, 1953, 1957.
- David M. Sorenson** ..... Assistant Professor of Psychology (1969)  
B.A., Brigham Young University, 1961; Ed.M., Harvard University, 1962.
- Irene Osmond Spears** ..... Professor of Humanities and Comparative Literature (1936)  
B.A., Brigham Young University, 1929; M.A., Ph.D., Stanford University, 1934, 1942.
- Walter H. Speidel** ..... Associate Professor of German (1963)  
Abitur, Germany, 1940; State Examination, Germany, 1948; M.A., University of Utah, 1960; Ph.D., University of Kansas, 1963.
- Berkley A. Spencer** ..... Associate Professor of Sociology (1969)  
B.A., M.A., Brigham Young University, 1960, 1962; Ph.D., Cornell University, 1967.
- Robert W. Spencer** ..... Associate Professor of Education (1970)  
B.S., M.S., Utah State University, 1963, 1964.
- Melvin Joseph Stanford** ..... Associate Professor of Business Management (1968)  
B.S., Utah State University, 1957; MBA, Harvard University, 1963; Ph.D., University of Illinois, 1968.
- John Stephen Staley** ..... Professor of Sociology (1969)  
B.A., M.A., St. Vincent College, 1938, 1939; M.A., Catholic University of America, 1950; Ph.D., University of Pittsburgh, 1960.
- Eric G. Stephan** ..... Associate Professor of Speech and Dramatic Arts (1968)  
B.S., Ph.D., University of Utah, 1961, 1966.
- Dale Stevens** ..... Assistant Professor of Geography (1969)  
B.A., Brigham Young University, 1961; M.A., Indiana University, 1963; Ph.D., University of California at Los Angeles, 1969.
- David V. Stimpson** ..... Associate Professor of Psychology (1964)  
B.S., M.S., Brigham Young University, 1959, 1960; Ph.D., University of California at Berkeley, 1964.
- Dayna L. Stocks** ..... Associate Professor of Botany (1964)  
B.S., Utah State University, 1956; M.S., University of Utah, 1960; Ph.D., Utah State University, 1964.
- Ted D. Stoddard** ..... Associate Professor of Business Education (1969)  
B.S., M.S., Brigham Young University, 1962, 1963; Ed.D., Arizona State University, 1967.
- William J. Strong** ..... Assistant Professor of Physics (1967)  
B.S., M.S., Brigham Young University, 1958, 1959; Ph.D., Massachusetts Institute of Technology, 1964.
- Darrell W. Stubbs** ..... Associate Professor of Music (1962)  
B.Mus., Eastman School of Music, 1949; M.M., Indiana University, 1952; DMA, University of Southern California, 1966.
- Clifford N. Stutz** ..... Professor of Civil Engineering (1969)  
B.S., University of Utah, 1932; M.S., University of Illinois, 1933; Registered Engineer Illinois, 1935, Utah, 1949.
- Howard C. Stutz** ..... Professor of Botany (1953)  
B.S., M.S., Brigham Young University, 1940, 1951; Ph.D., University of California at Berkeley, 1956.
- Floyd Sucher** ..... Associate Professor of Education (1964)  
B.S., Brigham Young University, 1954; M.A., Los Angeles State College, 1957; Ed.D., Colorado State College, 1963.
- Albert D. Swensen** ..... Professor of Chemistry (1947)  
B.A., M.A., Brigham Young University, 1937, 1938; Ph.D., Louisiana State University, 1941.
- Russel B. Swensen** ..... Professor of History (1933)  
B.A., Brigham Young University, 1926; M.A., Ph.D., University of Chicago, 1931, 1934.
- Joseph N. Symons** ..... Professor of Sociology (1953)  
B.S., M.S., Utah State University, 1927, 1932; Ph.D., University of Chicago, 1944.
- Wilmer W. Tanner** ..... Professor of Zoology (1949)  
B.A., M.A., Brigham Young University, 1936, 1937; Ph.D., University of Kansas, 1949.

<b>Charles D. Tate, Jr.</b>	Associate Professor of English (1960)
B.S., M.S., Utah State University, 1954, 1958; Ph.D., University of Colorado, 1966.	
<b>Dale H. Taylor</b>	Professor of Accounting (1963)
B.A., M.A., Brigham Young University, 1951, 1953; CPA, Illinois, 1955; Ph.D., Northwestern University, 1963.	
<b>James S. Taylor</b>	Associate Professor of Spanish (1962)
B.A., M.A., Brigham Young University, 1957, 1960; Ph.D., Ohio State University, 1967.	
<b>Stanley A. Taylor</b>	Associate Professor of Political Science (1968)
B.S., Brigham Young University, 1959; M.A., Ph.D., Fletcher School of Law and Diplomacy, 1961, 1968.	
<b>Weldon J. Taylor</b>	Professor of Marketing; Dean, College of Business (1937)
B.S., Brigham Young University, 1934; MBA, Harvard Graduate School of Business Administration, 1937; Ph.D., Graduate School of Business Administration, New York University, 1955.	
<b>Glen Elwin Thomas</b>	Assistant Professor of Education (1968)
B.S., M.Ed., University of Idaho, 1954, 1957; Ed.D., Colorado State College, 1968.	
<b>John A. Thomas</b>	Associate Professor of English (1962)
B.A., M.A., Brigham Young University, 1953, 1954; Ph.D., University of Maryland, 1962.	
<b>Robert K. Thomas</b>	Professor of English; Academic Vice-President (1951)
B.A., Reed College, 1947; M.A., University of Oregon, 1949; Ph.D., Columbia University, 1967.	
<b>Woodruff C. Thomson</b>	Professor of English (1950)
B.A., M.A., Ph.D., University of Utah, 1938, 1949, 1962.	
<b>Dennis Eugene Thorne</b>	Assistant Professor of Psychology (1966)
B.S., Brigham Young University, 1962; M.A., Ph.D., University of Utah, 1965, 1966.	
<b>James M. Thorne</b>	Assistant Professor of Chemistry (1966)
B.S., Utah State University, 1961; Ph.D., University of California at Berkeley, 1966.	
<b>Lucile Markham Thorne</b>	Associate Professor of Library and Information Sciences (1950)
B.A., M.Ed., Ed.D., Brigham Young University, 1929, 1956, 1967; M.S., University of Southern California, 1958.	
<b>Clark T. Thorstenson</b>	Assistant Professor of Recreation Education (1969)
B.S., M.R.Ed., Brigham Young University, 1962, 1965; Ph.D., University of Utah, 1969.	
<b>Alton L. Thygerson</b>	Assistant Professor of Health Sciences (1967)
B.S., M.H.Ed., Ed.D., Brigham Young University, 1962, 1965, 1969.	
<b>William D. Tidwell</b>	Assistant Professor of Botany (1966)
B.S., M.S., Brigham Young University, 1954, 1963; Ph.D., Michigan State University, 1966.	
<b>Frank M. Tippets</b>	Associate Professor of Art (1958)
B.A., M.A., Brigham Young University, 1953, 1962; Ed.D., Arizona State University, 1968.	
<b>Vernon John Tipton</b>	Associate Professor of Zoology (1968)
B.S., M.S., Brigham Young University, 1948, 1949; Ph.D., University of California at Berkeley, 1959.	
<b>Douglas F. Tobler</b>	Assistant Professor of History (1967)
B.A., M.A., Brigham Young University, 1961, 1962; Ph.D., University of Kansas, 1967.	
<b>F. Lamond Tullis</b>	Assistant Professor of Political Science (1969)
B.A., M.A., Brigham Young University, 1961, 1964; MPA, Ph.D., Harvard University, 1965, 1969.	
<b>Glen H. Turner</b>	Professor of Art (1947)
B.S., M.A., Brigham Young University, 1940, 1948.	
<b>Norman C. Turner</b>	Associate Professor of French and Italian (1970)
B.A., M.A., Brigham Young University, 1957, 1958; Ph.D., Syracuse University, 1962.	
<b>Rodney Turner</b>	Professor of Religious Instruction (1956)
B.A., M.A., Brigham Young University, 1949, 1953; Ed.D., University of Southern California, 1960.	
<b>L. Elliott Tuttle</b>	Associate Professor of Geography (1936)
B.S., M.S., Brigham Young University, 1938, 1948.	
<b>Richard D. Ulrich</b>	Professor of Mechanical Engineering (1960)
B.S., M.S., Ph.D., Purdue University, 1954, 1955, 1959.	
<b>John Franklin Valentine</b>	Associate Professor of Botany (1968)
B.S., Kansas State University, 1952; M.S., Utah State University, 1953; Ph.D., Texas A&M University, 1959.	

<b>Barbara Jane Vance</b>	Assistant Professor of Child Development and Family Relationships (1967)
B.A., University of Utah, 1956; M.A., Brigham Young University, 1959; Ph.D., Stanford University, 1967.	
<b>Curtis N. Van Alfen</b>	Professor of Teacher Education; Assistant Dean, College of Education (1967)
B.S., Utah State University, 1957, 1959; Ed.D., University of Utah, 1967.	
<b>Howard B. Vanfleet</b>	Professor of Physics (1960)
B.S., Brigham Young University, 1955; Ph.D., University of Utah, 1961.	
<b>Leo P. Vernon</b>	Professor of Chemistry; Research Director of Research Division (1954)
B.A., Brigham Young University, 1948; Ph.D., Iowa State University, 1951.	
<b>Leroy H. Walker</b>	Assistant Professor of Mathematics (1968)
B.S., University of Utah, 1955; M.S., Massachusetts Institute of Technology, 1957; Ph.D., University of California at Los Angeles, 1968.	
<b>Rudger H. Walker</b>	Professor of Agronomy (1968)
B.S., Brigham Young University, 1923; M.S., Ph.D., Iowa State University, 1925, 1927.	
<b>Max V. Wallentine</b>	Professor of Animal Science (1962)
B.S., Utah State University, 1955; M.S., Ph.D., Cornell University, 1956, 1960.	
<b>Charles Young Warner</b>	Associate Professor of Mechanical Engineering (1966)
B.S., M.S., Brigham Young University, 1957, 1963; Ph.D., University of Michigan, 1966; Registered Professional Engineer, Utah, 1967.	
<b>C. Terry Warner</b>	Associate Professor of Philosophy (1967)
B.A., Brigham Young University, 1963; M.A., Ph.D., Yale University, 1965, 1967.	
<b>S. ElVon Warner</b>	Assistant Professor of Business Education (1961)
B.S., M.S., Brigham Young University, 1960; Ed.D., Arizona State University, 1968.	
<b>Ted J. Warner</b>	Associate Professor of History (1962)
B.S., M.S., Brigham Young University, 1955, 1958; Ph.D., University of New Mexico, 1964.	
<b>Max L. Waters</b>	Associate Professor of Business Education (1958)
B.A., M.Ed., Brigham Young University, 1958, 1960; Ed.D., Colorado State College, 1963.	
<b>Jean Anne Waterstradt</b>	Associate Professor of English (1945)
B.A., Brigham Young University, 1945; MA., University of Southern California, 1955.	
<b>Arthur R. Watkins</b>	Professor of German (1952)
B.A., M.A., Brigham Young University, 1941, 1942; Ph.D., Stanford University, 1948.	
<b>Ray Watters</b>	Professor of Health Sciences and Physical Education (1957)
B.S., M.S., Utah State University, 1948, 1950; H.S.D., Indiana University, 1960.	
<b>Stanley H. Watts</b>	Associate Professor of Physical Education; Head Basketball Coach (1947)
B.S., Brigham Young University, 1938.	
<b>Max D. Weaver</b>	Associate Professor of Art (1961)
B.S., M.A., Utah State University, 1939, 1955.	
<b>Ross Maughan Weaver</b>	Assistant Professor of Speech and Dramatic Arts (1959)
B.S., M.S., Utah State University, 1950, 1951; Ph.D., University of Oklahoma, 1969.	
<b>Clark D. Webb</b>	Assistant Professor of Education (1965)
B.A., M.Ed., Brigham Young University, 1962, 1965.	
<b>Darrell Jack Weber</b>	Associate Professor of Botany (1969)
B.S., M.S., University of Idaho, 1958, 1959; Ph.D., University of California at Davis, 1963.	
<b>David G. Weight</b>	Assistant Professor of Psychology (1969)
B.A., M.S., Brigham Young University, 1963, 1965; Ph.D., University of Washington, 1969.	
<b>Stanley L. Welsh</b>	Professor of Botany (1960)
B.S., M.S., Brigham Young University, 1951, 1957; Ph.D., Iowa State University, 1960.	
<b>Dale H. West</b>	Professor of English (1947)
B.A., Brigham Young University, 1940; M.A., University of Southern California, 1955; Ed.D., University of Colorado, 1962.	
<b>Lorin F. Wheelwright</b>	Professor of Music; Dean, College of Fine Arts and Communications (1967)
B.S., University of Utah, 1930; M.A., University of Chicago, 1931; Ph.D., Columbia University, 1938.	
<b>Clayton M. White</b>	Assistant Professor of Zoology (1970)
A.B., Ph.D., University of Utah, 1961, 1968.	

<b>David Arnold White</b>	Assistant Professor of Zoology (1966)
B.S., M.S., Brigham Young University, 1961, 1964; Ph.D., University of Wisconsin, 1967.	
<b>Fred G. White</b>	Associate Professor of Chemistry (1961)
B.S., M.S., Brigham Young University, 1952, 1956; Ph.D., University of California, 1961.	
<b>Armand T. Whitehead</b>	Assistant Professor of Zoology (1969)
B.S., Brigham Young University, 1965; Ph.D., University of California at Berkeley, 1969.	
<b>Charles W. Whitman</b>	Assistant Professor of Speech and Dramatic Arts (1963)
B.A., Brigham Young University, 1957, 1958; Ph.D., University of Minnesota, 1966.	
<b>Leslie Whitton</b>	Associate Professor of Botany (1962)
B.S., Utah State University, 1949; M.S., University of California at Davis, 1953; Ph.D., Cornell University, 1964.	
<b>Harry E. Wickes</b>	Associate Professor of Mathematics (1967)
B.S., M.Ed., Brigham Young University, 1950, 1954; M.Ed., Harvard University, 1962; Ed.D., Colorado State College, 1967.	
<b>Marjorie Wight</b>	Assistant Professor of English (1963)
B.A., Brigham Young University, 1943; M.A., University of California at Los Angeles, 1958; Ph.D., University of Southern California, 1967.	
<b>Theodore A. Wight</b>	Assistant Professor of Mathematics (1963)
B.S., M.S., Ed.D., University of Utah, 1955, 1963, 1968.	
<b>Ray T. Wilcox</b>	Associate Professor of Secondary Education (1957)
B.S., M.Ed., Brigham Young University, 1951, 1954; Ed.D., University of California at Berkeley, 1957.	
<b>Doran F. Wilkes</b>	Associate Professor of Civil Engineering (1967)
B.S., M.S., Utah State University, 1951, 1955; Ed.D., University of Missouri, 1966.	
<b>Ernest J. Wilkins</b>	Professor of Spanish (1953)
B.A., Brigham Young University, 1947; M.A., Ph.D., Stanford University, 1949, 1954.	
<b>Ernest L. Wilkinson</b>	President of the University; Professor of Political Science (1951)
B.A., Brigham Young University, 1921; J.D., George Washington University, 1926; S.J.D., Harvard University, 1927; LL.D., Brigham Young University, 1957.	
<b>Milton G. Wille</b>	Associate Professor of Mechanical Engineering (1964)
B.A., BES, Brigham Young University, 1957, 1957; MSME, California Institute of Technology, 1958; Ph.D., University of Michigan, 1964; Registered Professional Engineer, Utah, 1965.	
<b>Glenn R. Williams</b>	Associate Professor of Music (1965)
B.A., Brigham Young University, 1953; M.M., DMA, Eastman School of Music, 1954, 1961.	
<b>Ray S. Williams</b>	Assistant Professor of English (1966)
A.B., Coker College, 1960; M.A., Ph.D., Florida State University, 1962, 1965.	
<b>Byron J. Wilson</b>	Associate Professor of Chemistry (1965)
B.S., Idaho State College, 1955; M.A., Southern Illinois University, 1958; Ph.D., University of Washington, 1961.	
<b>Marguerite I. Wilson</b>	Associate Professor of Special Education (1956)
B.S., University of Utah, 1948; M.A., San Francisco State College, 1955; Ed.D., George Peabody College for Teachers, 1965.	
<b>Warren B. Wilson</b>	Associate Professor of Art and Education (1954)
B.S., Utah State University, 1943; MFA, State University of Iowa, 1949.	
<b>Larry T. Wimmer</b>	Associate Professor of Economics (1963)
B.S., Brigham Young University, 1960; M.A., Ph.D., University of Chicago, 1962, 1968.	
<b>H. Geneva Winterrose</b>	Associate Professor of Education (1967)
B.S., M.S., Brigham Young University, 1948, 1951; Ed.D., Utah State University, 1968.	
<b>Edward J. Winward</b>	Assistant Professor of Educational Psychology; Chairman of Testing Service (1959)
B.S., M.S., Utah State University, 1959, 1960; Ph.D., University of Missouri, 1966.	
<b>Harold F. Wolfgramm</b>	Associate Professor of Education (1966)
B.S., M.S., Ph.D., University of Utah, 1959, 1960, 1964.	
<b>Heber G. Wolsey</b>	Professor of Communications; Assistant to President in Charge of Communications (1963)
B.S., Brigham Young University, 1942; M.A., Northwestern University, 1949; Ph.D., Michigan State University, 1967.	
<b>Glena D. Wood</b>	Professor of English (1952)
B.A., Brigham Young University, 1936; M.A., Ph.D., University of Kentucky, 1949, 1958.	

<b>Joseph S. Wood</b>	Assistant Professor of History (1967)
B.S., Ph.D., University of Utah, 1939, 1967.	
<b>Lowell D. Wood</b>	Assistant Professor of Economics (1969)
B.S., Brigham Young University, 1961; M.S., Montana State University, 1966; Ph.D., University of California at Berkeley, 1969.	
<b>Stephen L. Wood</b>	Professor of Zoology (1956)
B.S., M.S., Utah State University, 1946, 1948; Ph.D., University of Kansas, 1953.	
<b>Lael J. Woodbury</b>	Professor of Dramatic Arts (1954)
B.S., Utah State University, 1952; M.A., Brigham Young University, 1953; Ph.D., University of Illinois, 1954.	
<b>Richard C. Woodbury</b>	Associate Professor of Electrical Engineering (1959)
B.S., University of Utah, 1956; M.S., Stanford University, 1958, 1965.	
<b>Leon W. Woodfield</b>	Associate Professor of Accounting (1960)
B.S., MBA, University of Utah, 1956, 1957; CPA, California, 1959, Utah, 1960; DBA, Michigan State University, 1965.	
<b>Hugh James Woodford</b>	Assistant Professor of Physics (1968)
Diploma, Public Administration, University of Sidney, Australia, 1948; B.S., M.S., Brigham Young University, 1952, 1955; Ph.D., University of Utah, 1966.	
<b>Ralph Woodward</b>	Professor of Music (1955)
B.A. University of Idaho, 1937; M.M., Cincinnati Conservatory of Music, 1948; DMA, University of Illinois, 1964.	
<b>Earl M. Woolley</b>	Assistant Professor of Chemistry (1970)
B.S., Ph.D., Brigham Young University, 1966, 1969.	
<b>Richard R. Wootton</b>	Assistant Professor of Education (1963)
B.S., M.S., Ed.D., Brigham Young University, 1956, 1961, 1969.	
<b>Donald N. Wright</b>	Associate Professor of Microbiology (1969)
B.S., University of Utah, 1958; Ph.D., Iowa State University, 1964.	
<b>H. Curtis Wright</b>	Associate Professor of Library and Information Sciences (1969)
B.A., M.A., Brigham Young University, 1954, 1955; M.A., University of Southern California, 1959; M.S., Ph.D., Case Western Reserve University, 1968, 1969.	
<b>David H. Yarn, Jr.</b>	Professor of Philosophy (1950)
B.A., Brigham Young University, 1946; M.A., Ed.D., Columbia University, 1949, 1958.	
<b>Paul H. Yearout</b>	Professor of Mathematics (1962)
B.A., Reed College, 1949; M.S., Ph.D., University of Washington, 1958, 1961.	
<b>Ruth Wilson Young</b>	Assistant Professor of Education (1970)
B.S., Brigham Young University, 1945; M.E., Colorado State College, 1949; Ed.D., Brigham Young University, 1970.	

On authorization by the Graduate Council the service of members of the graduate faculty will be supplemented by that of other members of the University faculty whose advanced training and effective academic work in highly specialized fields qualifies them for service in the graduate program.

# General Information

## History and Purpose

Brigham Young University was founded as an academy of The Church of Jesus Christ of Latter-day Saints in 1875. It became a university in 1903. The first graduate program began in 1916; the first master's degree was awarded in 1919. Some doctoral programs were inaugurated in 1957, with the first doctorates awarded in 1961.

The purpose of the Graduate School is to promote quality programs for academic and professional education as a means of meliorating the conditions of human life. Acute intellectual ability coupled with deep moral and spiritual commitment is seen as the ideal.

## Organization

### The Graduate Dean

The dean is responsible for leadership and administration of the entire Graduate School. The Office of the Graduate Dean has as its principal function the processing and maintenance of student records while assuring high quality in individual student programs.

### The Graduate Council

This council is composed of members elected from the graduate academic areas of the University and is presided over by the graduate dean. This body recommends policy for the Graduate School as a whole, processes all proposals for new degree programs, and conducts a continuous review of existing programs.

### College Deans, Department Chairmen, and Graduate Coordinators

These individuals implement graduate programs under approved policies and serve a critical quality-control function relative to individual student programs.

### The Graduate Faculty

Specially qualified members of the University faculty constitute the graduate faculty. Close professional and personal association of students with graduate faculty in learning, research, and teaching experiences helps provide students with the knowledge, skills, and judgment of a highly competent professional person.

### Graduate Student Steering Committee

Student representatives from the graduate academic areas are members of this committee. They consult on procedures for upgrading the Graduate School and conduct schoolwide academic and social student functions.

## Graduate Degrees

The Graduate School offers the master's degree in more than eighty-five fields distributed through forty-nine graduate departments and the doctor's degree in more than forty fields distributed through twenty graduate departments as follows:

### Doctor of Philosophy

Botany and Range Science  
Botany  
Chemistry  
Analytical-Physical Chemistry  
Biochemistry  
Inorganic Chemistry  
Organic Chemistry  
Physical Chemistry  
Child Development and Family Relationships  
Child Development  
Family Relationships  
Marriage and Family Counseling  
Education  
Educational Psychology

Engineering  
Chemical Engineering Science  
Civil Engineering Science  
Electrical Engineering Science  
Mechanical Engineering Science  
English  
American Literature  
English Literature  
French and Italian  
French  
Geology  
Economic Geology  
Mineralogy, Geochemistry, and  
Petrology  
Paleontology

## GENERAL INFORMATION

Stratigraphy and Sedimentation	Spanish and Portuguese
Structural and Field Geology	Portuguese
Germanic and Slavic Languages	Spanish
German	Speech and Dramatic Arts
History	Dramatic Arts
Microbiology	Interpretation
Music	Speech
Physics and Astronomy	
Psychology	<b>Master of Science</b>
Clinical Psychology	Agronomy and Horticulture
Social Psychology	Agronomy
Religious Instruction—Ancient Scripture	Animal Science
Religious Instruction—Church History and	Botany and Range Science
Doctrine	Botany
History of Religion	Range Science
Sociology	Business Education
Spanish and Portuguese	Chemistry
Spanish	Analytical-Physical Chemistry
Speech and Dramatic Arts	Biochemistry
Dramatic Arts	Inorganic Chemistry
Zoology	Organic Chemistry
	Physical Chemistry
<b>Doctor of Education</b>	Child Development and Family Relationships
Education	Child Development
Educational Administration	Family Relationships
Educational Psychology	Economics
Elementary Curriculum and Instruction	Engineering
Junior College Administration	Chemical Engineering Science
Physical Education	Civil Engineering Science
Secondary Curriculum and Instruction	Electrical Engineering Science
	Mechanical Engineering Science
<b>Master of Arts</b>	Food Science and Nutrition
Anthropology and Archaeology	Geography
Archaeology	Geology
Art	Economic Geology
Painting and Sculpture	Mineralogy, Geochemistry, and
Design	Petrology
Asian Studies	Paleontology
Chemistry	Stratigraphy and Sedimentation
Analytical-Physical Chemistry	Structural and Field Geology
Inorganic Chemistry	Health Sciences
Organic Chemistry	Home Economics Education
Physical Chemistry	Industrial Education
Classical and Asian Languages	Mathematics
Latin	Microbiology
Communications	Physical Education
Education	Physics and Astronomy
Counseling and Guidance	Psychology
Educational Administration	General Psychology
Educational Psychology	School Psychology (interdepartmental)
Elementary Curriculum and Instruction	Sociology
School Psychology (interdepartmental)	Speech and Dramatic Arts
Secondary Curriculum and Instruction	Communicative Disorders
Special Education	Statistics
English	Zoology
American Literature	
English Literature	<b>Master of Accountancy</b>
English Language	Accounting
French and Italian	
French	<b>Master of Business Administration</b>
Germanic and Slavic Languages	Business Management
German	
History	<b>Master of Communicative Habilitation</b>
Humanities and Comparative Literature	Speech and Dramatic Arts
Comparative Literature	Communicative Disorders
Latin-American Studies	
Linguistics	<b>Master of Education</b>
Music	Education
Music Education	Counseling and Guidance
Music Theory	Educational Administration
Musicology	Educational Psychology
Physical Education	Elementary Curriculum and Instruction
Physics and Astronomy	Instructional Media
Political Science	Reading Specialist
American Political Systems, including	School Psychology
Public Administration and Public Law	Secondary Curriculum and Instruction
Comparative Political Systems	Special Education
International Politics	
Political Theory and Philosophy	<b>Master of Fine Arts</b>
Recreation Education	Art
Religious Instruction—Ancient Scripture	
Religious Instruction—Church History and	<b>Master of Engineering</b>
Doctrine	Chemical Engineering Science
History of Religion	Civil Engineering Science

Electrical Engineering Science	Organ
Mechanical Engineering Science	Piano
*Master of Engineering Science	Voice
Chemical Engineering Science	
Civil Engineering Science	
Electrical Engineering Science	
Mechanical Engineering Science	
<b>Master of Health Education</b>	<b>Master of Public Administration</b>
Health Sciences	Institute of Government Service
	Public Administration
<b>Master of Industrial Education</b>	<b>Master of Recreation Education</b>
Industrial Education	Recreation Education
	Community School Leadership
<b>Master of Library Science</b>	Minors are offered in the fields listed above
Graduate Department of Library and	in addition to the following fields:
Information Sciences	Agricultural Economics
	Applied Music
 	Basic Chemistry
<b>Master of Music</b>	Business Management
Music	Computer Science
Orchestral Instruments	Philosophy
	*In cooperation with University of Utah
	and Utah State University.

## General Regulations

It is the responsibility of each student in the Graduate School to know and conform both to the following general regulations and to the additional requirements of his department. These general regulations may change from year to year. Students should consult the **Graduate School Catalog** each year to be aware of current regulations.

### New Regulations

Important new regulations effective September 1, 1971, are as follows:

1. Credit registered after September 1, 1971, on nondegree status may not apply to requirements for any graduate degree at Brigham Young University.
2. Only degree-seeking students are admitted to and register in the Graduate School. Nondegree students are admitted by the University Admissions Office and register in the undergraduate colleges.
3. All doctoral students must achieve candidacy at least one full semester before graduating.
4. The residence requirement for all master's degrees is twenty hours of credit on the Provo campus.
5. The residence requirement for all doctoral degrees is two consecutive, full-time semesters in residence on the Provo campus. For the Ph.D., this is exclusive of any residence requirements fulfilled for the master's degree.

### University Standards

The maintenance of high standards of honor, integrity, and morality; of graciousness in personal behavior; of Christian ideals in everyday living; and the complete abstinence from alcohol and tobacco are required of every student while on the campus, at home, or wherever he may be as long as he is in student status. Registration signifies a student's willingness to conform to these standards. A copy of the code of student conduct is available from the dean of students, A-209 ASB.

Any pronouncement of disciplinary measures made by the President of the University becomes a part of these regulations. Violations of these regulations make the offender liable to suspension or expulsion from the University.

## Admission

Students of any race, creed, color, or national origin are accepted for admission to Brigham Young University provided they maintain ideals and standards in harmony with those of The Church of Jesus Christ of Latter-day Saints and meet the University's academic requirements.

Admission to the Graduate School is contingent upon acceptance in a particular department and program as a degree-seeking student. To be considered, applications must include each of the following items and be filed before the announced deadlines.

1. Fully completed application form
2. Nonrefundable application fee of \$15
3. Two transcripts of all college work
4. Three letters of recommendation on forms provided by the Graduate Admissions Office (D-251 ASB)

Each applicant is notified in writing by the Graduate School concerning his admission or nonadmission. Application deadlines for degree-seeking students are as follows:

Fall Semester—June 30; Spring Semester—December 17; Summer School (either term)—May 1.

(Note: Application deadlines for nondegree students are Fall Semester—July 30; Spring Semester—January 18; Summer School [either term]—May 31.)

## Student Classification

### Degree-seeking Status

1. **Regular.** Students who have met all prerequisites and are fully accepted by the academic department as ready to proceed with a regular graduate program in that department are placed on **regular** status.
2. **Provisional.** Students who lack prerequisites, language or tool preparation, or who have low grade-point records are placed on **provisional** status. Notice of provisions to be fulfilled is sent to the student on the acceptance form. Fulfillment of provisions as stipulated by the academic department automatically advances the student to regular status.

### Nondegree Status

Registration of students with baccalaureate degrees on a nondegree basis is permitted for teacher certification and for taking classes of personal interest to the student. Such students are not officially part of the Graduate School. All auditors must be formally admitted and registered. Students of nondegree status must apply for admission through the University Office of Admissions and Records and register with the undergraduate students in the various colleges.

## Continuous Registration

Details of the registration and records procedures are outlined in the class schedule issued each semester by the University Office of Admissions and Records.

When a student is admitted to a degree program, it is expected that he will work continuously and will register in that program until all requirements are completed. Normally a student will register each semester for a minimum of two semester hours of credit in work which is filed as part of his approved graduate program. Each student must, in any case, meet the following minimum requirements:

1. Register for at least six hours of approved program credit during each academic year.
2. Register for at least two hours of approved program credit during any

semester or Summer School in which University personnel are consulted or facilities are used.

### Graduate Credit for Seniors

If, during the last semester of the senior year, a candidate for a baccalaureate degree finds it possible to complete all requirements for such a degree with a registration of fewer than fifteen hours of undergraduate credit, he may register for graduate credit to the extent that the total registration shall not exceed fifteen hours during the semester. A form provided by the Office of the Graduate Dean stating that all baccalaureate requirements are being met during the current semester must be signed by the appropriate undergraduate dean and presented to the dean of the Graduate School at the time of such registration. Normally, students requesting such permission will have previously applied for admission to a graduate degree program. Any who have not done so are urged to complete the application during that semester.

Three-year master's degree programs have been approved in accounting, physics, chemistry, and engineering. Under these programs, the departments are authorized to make a special arrangement in which a limited amount of graduate work is taken before the final semester of the senior year.

### Student Advisement

Every student accepted on a degree-seeking basis is assigned a sponsor (who is designated on the acceptance form). The student is expected to make immediate contact with his sponsor, stay in contact, and meet with the sponsor at least weekly during periods of regular enrollment. The sponsor's commission is to guide the student in his registration and individual study until such time as he is ready to proceed as a regular degree-seeking student under the auspices of an advisory committee.

The department chairman will appoint an advisory committee consisting of at least two persons for a master's committee and three for a doctoral committee. Minor fields must be represented by a member of the advisory committee. The advisory committee is to direct the student through those experiences which will enable him to satisfy all requirements and examinations pertinent to his degree program.

### Student Programs

Immediately after the formation of the advisory committee, the student should prepare and file his course outline, on the forms provided, in the Office of the Graduate Dean. This outline should reflect all prerequisites taken on provisional status, all tool subjects required, thesis credit, English 99 (when required), and all regular courses to be taken. This course outline must be completed under the direction of the advisory committee and signed by them.

As soon as possible after the formation of the advisory committee, the student should file an approved thesis, project, or dissertation prospectus with the Office of the Graduate Dean.

When there is a needed change in the student's course outline, the chairman of the committee will indicate this in a memorandum which is to be endorsed by the department chairman or graduate coordinator and filed in the Office of the Graduate Dean. For a change of advisory committee, the department chairman or graduate coordinator will submit a memorandum requesting this change to the Office of the Graduate Dean.

### Scholastic Standards

A grade-point average of 3.0 for all credit applying toward the degree is required of any student earning a degree in the Graduate School. No "D" credit can apply toward a graduate degree. A degree-seeking student (regular or provisional) whose cumulative grade-point average, while registered in the Graduate School, falls below 3.0 shall be placed on academic probation.

## Submission of Theses and Dissertations

All theses and dissertations must be submitted to the dissertation secretary, D-227 ASB. Copy must be in final form and must be submitted at least two weeks prior to the final oral examination. Form No. 6, Departmental Tentative Approval of Theses or Dissertations, signed by the committee, must accompany the thesis or dissertation. This form is to be obtained from the student's major department. One extra signed copy of the abstract must be submitted (two copies if the student is majoring or minoring in education) at this time.

When the thesis or dissertation has been checked for format by the dissertation secretary, the student is issued Form No. 7, Submission of Theses and Dissertations, for the purpose of (1) accepting the thesis or dissertation as it is; (2) rejecting the thesis or dissertation, which would then necessitate a retyping to be resubmitted prior to scheduling the oral examination; or (3) accepting the thesis or dissertation contingent upon the correction of minor format errors to be made prior to submitting the thesis or dissertation to the library for binding. The required corrections will be listed on Form No. 7 along with any changes necessary as a result of the oral examination. This form, after being signed by the committee chairman, certifying that all required changes have been made, will serve as the binding permission slip.

The student will also be issued Form No. 8, Final Oral Examination Schedule, which should be properly filled out, signed, and returned to the Office of the Graduate Dean, D-208 ASB, where the candidate's records will be checked. If requirements are complete, Form No. 9, Committee Member's Evaluation of Final Oral Examination, and Form No. 10, Report of Committee Action on Final Oral Examination, will be issued to the candidate to be taken to the final oral examination.

Following the final oral examination, changes recommended in the thesis or dissertation, both by the dissertation secretary and the examining committee, must be made. The signature of the committee chairman and the departmental graduate coordinator on Form No. 7 will certify the completion of these changes, and the original and three copies (four copies for students in the CDFR Department) of the thesis or dissertation must be submitted to the library for binding.

When the Graduate School receives the binding receipt from the library, graduation requirements are complete.

## Graduation

A student who contemplates graduation should secure from the Office of the Graduate Dean an Application for Graduation form and pay the graduation fee of \$20 at the Treasurer's Office. This should be done not later than December 15 for June graduates and February 15 for August graduates, and before submitting the thesis or dissertation to the Office of the Graduate Dean for approval as a basis for scheduling the final examination. A \$3 late fee will be charged if paid after the above dates. Students who have made application for graduation and paid the graduation fee will be charged a \$2 reevaluation fee if they do not graduate in the commencement for which application is made.

All graduating students must attend the commencement and convocation exercises unless they have made satisfactory explanations of absence and have been officially excused under the authority of the President of the University. The request to be excused from the commencement and/or convocation exercises must be presented in writing to the dean of the Graduate School, D-208 Smoot Administration Building, at least two weeks prior to commencement. Extreme emergencies are the only exceptions to this requirement. Students not officially excused from these exercises will not be graduated until they are excused from or attend a later commencement.

## Credits Certified by Special Examination

Under certain circumstances graduate students who are working in degree programs at BYU may have the need to have certain of their credits certified

by special examination. It is the policy of the Graduate School that students must pay for these examinations. Payment must be made in advance in an amount equivalent to ordinary registration fees for the amount of credit concerned. This arrangement applies specifically to the following situations:

1. Graduate credit taken at Brigham Young University, or another accredited university in the United States, which has become outdated under the time limit regulations.
2. Graduate credit which a student desires to transfer from a non-accredited institution or from a foreign university whose academic standards are not known to the faculty at BYU.

Applications for this purpose can be obtained in the Office of the Graduate Dean.

### Time Limits

Graduate credits are applicable toward the master's degree only within a five-year period from the time they are received.

All academic credit applying toward the doctor's degree, exclusive of that earned in completion of the master's degree, must be completed within a period not to exceed eight years.

### Student Load

An academic load for graduate students not employed part time is from nine to fifteen semester hours or their equivalent. Twelve hours is a standard graduate load. Graduate teaching or research assistants are required to carry a minimum of six hours of credit, approved by the registration adviser and the dean of the Graduate School, but are not eligible for the maximum registration load. A one-half-time graduate teaching or research assistant should not expect a registration authorization for more than ten semester hours. Full-time employees should register for not more than five semester hours. Due to the depth required in graduate study, students usually should take less than the maximum load permitted.

### Graduate Awards

Further information concerning graduate awards is available through the Graduate Awards Office, D-227 ASB.

#### BYU Awards

Teaching and research experience are seen as integral and indispensable parts of graduate student programs. For this reason, graduate awards given by Brigham Young University are in the form of teaching and research assistantships. These awards are administered through the academic departments of the Graduate School and vary according to the requirements and opportunities of the different disciplines. The most remunerative of these awards total \$3,300 per academic year. Application for these awards should be made through the chairman of the academic department.

#### Government Institutional Awards

A limited number of National Defense Education Act Title IV Fellowships and National Science Foundation Graduate Traineeships are available to outstanding graduate students at Brigham Young University. These awards are made by the Graduate School through the academic departments.

#### American Indian Awards

Special graduate awards are available for American Indian students. For further information, contact the Graduate Awards Office.

#### National Science Foundation Graduate Fellowships

**Qualifications.** Fellowships are awarded by the National Science Foundation to outstanding graduating seniors or graduate students in biological, engineering,

physical, and social sciences who are U.S. citizens, hold a bachelor's degree at beginning of tenure, and are admitted to the Graduate School in programs leading to advanced degrees. Scores earned on the GRE are required for each applicant.

**Value.** A stipend of \$2,400 for the first level, \$2,600 for the intermediate level(s), and \$2,800 for the terminal level is provided, plus tuition and fees and \$500 per eligible dependent. Fellowships are granted for one or two years and may be renewed.

**Application.** Office cards, indicating intention to apply, are available in the Graduate Awards Office in October. NSF sends each applicant the necessary forms. Applications must be returned by the first week in December.

### Student Loans and Financial Aids

Limited funds are available to help students remain in school when financial emergencies have arisen and personal or family resources are not available.

#### Short-Term Loans

Short-term loans are available for emergency assistance for tuition, books, fees, and other school expenses to full-time day students. These loans are made in small amounts for immediate requirements. Repayment is required within the current semester.

#### Church Student Loan Fund

The Church of Jesus Christ of Latter-day Saints makes aid available through a long-term loan program by which loans may be made to worthy full-time LDS students who are in critical financial need for tuition, books, fees, and other school expenses. Loans may be made each year in amounts usually not in excess of \$500 for graduate students. The student may be permitted to delay making repayment until after he discontinues his full-time status at BYU.

#### Application

Information regarding financial aids and application forms is available in the Financial Aids Office, D-151 ASB.

## Master's Degree

### Amount and Distribution of Credit

The master's degree requires a minimum of thirty semester hours of credit. Of these thirty hours, twenty-one shall be earned in courses for which there is a systematic body of subject matter. Registration for individual reading, literature review, thesis research, or special problems may not be included in this total of twenty-one credit hours.

The master's thesis must carry a minimum of six hours. The thesis credit shall include such disciplines as review of the literature, all thesis research, and the writing of the thesis. Registration for thesis credit and work on the thesis must be concurrent.

A department, after authorization by the Graduate Council, may function under Option I and/or Option II.

#### Option I

At least fifteen semester hours, exclusive of thesis, must be in the major field and at least nine semester hours in a minor field approved by the major department. The minor department must approve the specific courses which constitute the minor.

**Option II**

Thirty hours must be in the major field or in direct support of the major field. Under this option at least twelve hours must be in the major field of course work.

A graduate student may have applied toward requirements for the master's degree a limited amount of credit earned by taking certain upper-division undergraduate courses which have been approved by the graduate advisory committee at the time of registration or appear on the course outline of a degree-seeking student. At least twenty hours of the credit for the master's degree must be in the 500 series or above and taken on the Provo campus.

A minimum grade-point average of 3.0 is required in all work applying toward the degree.

Neither lower-division nor correspondence credit can be applied toward a graduate degree.

**Transfer Credit**

Graduate credit (only) acceptable to a student's advisory committee and not in excess of ten semester hours may be transferred from another accredited university of the United States upon the approval of the student's advisory committee and the Graduate Council. Forms for petitioning for such transfers are available in the Office of the Graduate Dean. All transferred credit must be of grade "B" or better. At least twenty semester hours toward the master's degree must be taken on the Provo campus.

## Sixth-Year Certificate Specialist in Education

The Education Area offers a sixth-year program in each of the following areas: educational administration, curriculum and instruction, counseling and guidance, special education, and reading.

## Doctor of Education Degree

### Admission Requirements

For admission to degree-seeking status as a doctoral applicant, the student must have completed twenty-two semester hours of education, or possess certification as a teacher, and must have completed two years of successful professional experience. Successful completion of a three-hour seminar is prerequisite to admission on regular status.

### Classification of Doctoral Students

Students seeking the Doctor of Education degree are classified as **degree applicants** and **degree candidates**. The student becomes a doctoral applicant on recommendation by his department chairman or graduate coordinator. The department will normally require an examination or other screening procedure prior to this recommendation. The student is admitted to candidacy after meeting

conditions for admission to candidacy and before registering for the field project or dissertation and internship.

### Residence Requirements

The equivalent of a minimum of three years of full-time study beyond the bachelor's degree is required. Full-time study is defined as nine to fifteen hours in course work or the equivalent in research per semester. The advisory committee has authority to decide what work will be accepted to meet these requirements. At least two consecutive semesters of work, during each of which a student is registered for not less than nine semester hours, must be taken on the Provo campus.

### Tool Requirement

There is no foreign language requirement. The student must demonstrate proficiency in statistics to the satisfaction of the advisory committee.

### Admission to Candidacy

To be eligible for advancement to candidacy, the student must satisfactorily pass the final qualifying written examination and submit a field project or dissertation prospectus approved by his doctoral advisory committee. Notice from the Office of the Graduate Dean then admits the student to candidacy for the degree. **Every doctoral student must have been certified for candidacy at least one full semester prior to graduation.**

## Doctor of Philosophy Degree

### Classification of Doctoral Students

Students admitted to the Doctor of Philosophy degree program are classified as **degree applicants** and **degree candidates**. The student becomes a doctoral applicant on recommendation by his department chairman or graduate coordinator. The department will normally require an examination or other screening procedure prior to this recommendation.

### Residence Requirements

A full semester of residence credit is defined as from nine to fifteen hours in course work or the equivalent in research per semester. The advisory committee has authority to decide what work will be accepted to meet these requirements. Ordinarily two years of full-time course work or research or its equivalent are to be taken on the Provo campus. At least two consecutive semesters of work, during each of which a student is registered for not less than nine semester hours, must be taken on the Provo campus.

### Tool Requirement

For the academic areas in which a significant body of subject matter related to the pursuance of the Ph.D. degree is published in languages other than English, it is expected that doctoral candidates will include foreign languages as a necessary prerequisite to study in their respective fields. Where justified by the subject matter of the major area, however, a tool subject replacement for foreign language may be made.

In any case, the foreign language or the tool subject requirement should be considered a prerequisite to regular status as a degree-seeking student and

is not to be considered as part of regular course work for accumulating credit hours in the major or minor fields of study.

Any of the four options below will satisfy the language-tool subject requirements. Departments specify which option or options are appropriate for their respective areas as approved by the Graduate Council.

#### **Option I: Single-Language Requirement**

The student shall be required to demonstrate a thorough familiarity with French, German, or Russian, or another foreign language that may be recommended by the department and authorized by the Graduate Council. Fulfillment of this requirement will be manifest through examination that will demonstrate (1) the candidate's ability to translate literature in the field of specialization with a competent level of speed and accuracy and (2) the candidate's ability to communicate orally in the language with acceptable facility. In lieu of a special examination that will demonstrate adequate use of the foreign language selected, this requirement can be met by the completion, with an average grade of "B" (3.0) or higher, of a minimum of twenty-two semester hours in the language. Students familiar with the language may be able to earn the first sixteen of the total twenty-two semester hours' credit by special examination, thereby qualifying them to register for the remainder of the credit from courses 321, 415, and 416, or their equivalent.

#### **Option II: Two-Language Requirement**

Any one or a combination of the following provisions meets the two-language requirement. One of the languages must be French, German, or Russian. The second language may be one recommended by the department and authorized by the Graduate Council.

1. Successful completion of the ETS examination (given only in French, German, Russian, or Spanish). Dates of and application for these examinations are made with the BYU Testing Service, D-238 ASB.
2. Successful completion of language courses 95 and 96 in either or both acceptable languages (offered only in French, German, or Spanish).
3. Successful completion of sixteen semester hours of credit in the foreign languages that are approved by the major department and the Graduate Council for the degree program.

#### **Option III: One Language and One Tool Subject**

This requirement may be met by including one of the languages in Option II plus eight to ten credit hours in any combination from the departments of Statistics, Computer Science, or Mathematics as approved for each department by the Graduate Council. Hours in mathematics would be beyond Math. 111.

#### **Option IV: Single Tool Subject**

This option would normally consist of an integrated program of eighteen to twenty-one semester hours of undergraduate studies in the departments of Mathematics, Statistics, and Computer Science in any combination, as approved for each department by the Graduate Council, showing systematic tool development. Hours in mathematics would be beyond Math. 111.

### **Comprehensive Examination**

The student must pass a comprehensive examination in his doctoral fields under the direction of his major department. The minor department will be responsible for examining the student in the minor area. This examination will normally be given at the end of the second year of graduate study.

### **Admission to Candidacy**

Satisfactory completion of the language requirement and the comprehensive examination, and submission of a dissertation prospectus, approved by an advisory committee, are necessary for admission to candidacy for the Doctor of Philosophy degree.

The student has the responsibility of filing with the Office of the Graduate Dean a form, provided by the same office and signed by the advisory committee and the chairman of the major department or graduate coordinator, stating that all conditions for admission to candidacy have been met and that the dissertation subject has been approved. Notice by the dean of the Graduate School then admits the student to candidacy for the degree. **Every doctoral student must have been certified for candidacy at least one full semester prior to graduation.**

## General University Services

### University Library

The J. Reuben Clark, Jr., Library contains the library collection, which includes approximately one million bound volumes, several thousand pamphlets, and an extensive collection of titles on microfilm and microcards. A good selection of professional journals and other current periodicals, as well as local, regional, and national newspapers, is also available.

The library is a depository for United States and Canadian government documents and regularly receives publications of international, national, state, and local governments. The general library facilities are available to students, faculty, alumni, and other interested persons. Regularly enrolled students present their activity cards to borrow books. Others may obtain a permit from the circulation librarian. The library is open during the college year from 6:45 a.m. to 11:00 p.m. Monday through Thursday, Friday from 6:45 a.m. to 10:00 p.m., and from 9:00 a.m. to 6:00 p.m. Saturdays. Vacation hours, when school is not in session, are 8:00 a.m. to 5:00 p.m. Monday through Friday; the library is closed on holidays.

The general collection is available on open shelves on four of the five levels—two below and two above the ground floor. The central reference collection, the public catalog, the circulation desk, and administrative offices are located on the ground level. An informational booklet is available to assist in the use of these facilities. A self-guided library tour on tape is also available at the desk of the music listening library. Study space is available on each floor, interspersed with stack areas. Individual study carrels are available to approved graduate students working on theses and dissertations.

The special collections of the library, located on the fourth level, often come to the library from individuals whose interests lead them to devote many years to their acquisition. The books and other material housed in this area are not available for general circulation. Material within each collection is usually confined to a specific subject area.

The facilities of other libraries operated by the LDS Church are available also to students of Brigham Young University. The Genealogical Society Library in Salt Lake City contains approximately one hundred thousand books and a half million rolls of microfilm. These include family histories; genealogies; biographies and autobiographies; military records; cemetery inscriptions; town, county, and state histories of the United States; and both local and national histories of other nations.

Facilities of the library of the Church Historian's Office are available by arrangement to advanced students for research. It is located in Room 103 of the LDS Church Office Building, 47 East South Temple in Salt Lake City, and is open from 8:30 a.m. to 5:00 p.m. Monday through Friday. Its collections contain publications of the Church, periodicals of the various auxiliary organizations, reports and histories of the various missions, general history of the Church, biographies of Church leaders, and other pertinent published and archival material.

### Summer Session

Graduate students doing part of their work at the University during the summer will find a wide range of graduate courses suited to their purpose. Sum-

mer School is divided into two terms. Students may register for a maximum of six credit hours per term.

### Evening Classes

Regular graduate credit, equivalent to daytime classes, is given for evening classes. Day students may enroll in evening classes on their regular registration card by picking up cards marked "Section 90." An extra fee of \$3.00 per credit hour is charged for these classes. Class schedules, listing classes and giving detailed information about all procedures, are available free of charge upon request.

Evening class registration should not be confused with official admission to the Graduate School.

### Off-Campus Centers

The University has established several off-campus Centers for Continuing Education:

BYU-Ricks Center, 225 First Street, Idaho Falls, Idaho

BYU-Ogden Center, 555-24th Street, Ogden, Utah

BYU-Salt Lake Center, 200 North Main Street, Salt Lake City, Utah

BYU-California Center, 203 West Cottage Drive, Covina, California

Additional classes are offered in other geographical areas, administered by the campus-based department of Off-Campus Lectures and Courses.

### Registration Requirements

Any individual with a baccalaureate degree may properly register for graduate classes. No class registered for on a nondegree basis may apply to a graduate degree program at Brigham Young University.

### Application for Admission

A student desiring to enroll in a graduate program at BYU must take the initiative and be admitted to the Graduate School on a degree-seeking basis. Applications and letter forms are available at each center. Entrance examinations are also given periodically at the centers or may be taken at BYU in Provo.

### Computer Center Facilities

Through the Computer Research Center extensive computing facilities are available to all faculty and students. In addition to equipment, extensive computer library programs and experienced personnel are available to help users with their own particular problems. It is expected that the academic users will provide their own programming and data preparation.

There are at present six major computing centers on campus:

1. The Computer Research Center is housed in the new mathematical sciences/computer building. Equipment includes an IBM 360/50 with one million bytes of bulk core and all basic input/output equipment, including remote terminals in the administrative and academic areas.
2. The Computer Research Center operates a satellite operation in 62 JKB which houses one IBM 1130 with standard reader, printer, disk, key-punches, and terminals.
3. The Science Computation Center, 142 ESC, includes a large-scale Librascope L3055 with card and tape input and printer and tape output. This center also includes a PDP-15 with graphic terminal capability.
4. The Engineering Analysis Center includes an L3055 with punched card, optical card, and tape input as well as tape and printer output. This installation also has a SEL-810/B to accommodate data acquisition and computer control experiments. A twelve-inch plotter is also available.
5. The Engineering Technology Center, 215 SNLB, includes a PDP-8/I with card and paper tape input, paper tape output, and six remote terminals.

In 115 SNLB there is a PDP-8/I with one Tektronix graphic screen and sensor probes attached to on-line real-time control of cutting tools.

6. The Psychology Department also has a PDP-8 in their experimental lab area which controls on-line experiments.

In addition to these six centers, there is a PDP-11 in the nuclear lab of the Eyring Science Center; a PDP-11, used by the Division of Instructional Services, which controls a switching network; and a Burroughs 500 in the Clark Building which is used by Educational Media Services for counting purposes.

Though all of this is University-wide equipment, some of it has specialized commitments. Questions about the use of any equipment should be sent to the director of Computer Services, 165 MSCB.

### Placement Center

The Placement Center, located in the Abraham O. Smoot Administration and General Services Building, assists graduating students and alumni to find desirable positions in their fields in business, industry, government, and education. This office works in close cooperation with deans and department chairmen.

The placement service includes a placement library where interested students may find books, articles, magazines, and brochures that will acquaint them with companies in which they may be interested and also books and pamphlets which will give advice on such matters as how to conduct oneself in an interview, how to write effective letters of application, how to find employment, etc.

All students are urged to register with the Placement Center early in the school year in which they will complete requirements for a degree or other postgraduate program. Early registration will enable that office to give the most effective possible assistance as each graduate seeks employment.

### Student Employment

In the Campus Employment Office assistance is given to needy students in finding part-time employment. This includes help not only in placing students in positions on the University campus, but also in finding part-time employment off campus.

In order that students may adequately pursue their academic work, it is suggested that they devote as much time as possible to their studies and not attempt to work also. When a student must work in order to supplement his college funds, he should be aware that there is a maximum limit of twenty hours per week that he may work on campus.

Students needing employment are urged to register with the Campus Employment Office as soon as possible after they arrive in Provo and are available for work. Need weighs most heavily in deciding who shall receive leads for jobs, but hours available and required skills are also important considerations. The best schedule for which part-time work can be arranged is one where the free hours (a block of three to four hours) are in consecutive order at the same time each day. Inasmuch as the number of students seeking part-time work is very high, those whose need is great are requested to report periodically at the employment office after filing initial application.

Students from foreign countries are required to obtain a work permit before they may take employment. Such students may receive assistance in obtaining the necessary permit from the foreign-students adviser.

### Security and Traffic

The Security Office is a protective agency established for the benefit of students, faculty, and staff. It maintains effective liaison with the local police department and is entrusted with the proper enforcement of campus rules and regulations. All matters concerning security or requiring police action should be referred to this office.

Another major responsibility of the Security Office is the control of campus vehicle traffic and parking. Every BYU student who expects to own, maintain,

possess, drive, or store a motor vehicle in or about the city of Provo, Utah, during the time the University is in session shall register such vehicle with the Security Office within forty-eight hours after bringing said vehicle to the Provo area. In the case of students this is a registration for identification only, not a parking permit. All staff members and students who plan to park on University parking lots between 6:00 a.m. and 4:00 p.m. on school days must display a parking permit on their motor vehicles. The student parking permit may be purchased at the time of registration.

Brigham Young University maintains a zoned parking system. Upperclass permits are \$12.00 for juniors, seniors, and graduates. Lowerclass permits are \$6.00 and available for all students. The required registration is free but allows no campus parking until after 4:00 p.m.

The Security Office also offers many other services to students and staff members: the taking of fingerprints necessary for teaching certificates, government jobs, and AFROTC, and an ambulance service in connection with the student health center.

All campus roads will be closed on Christmas Day each year to preserve the private ownership thereof.

### **Lyceums and Forums**

Almost since its founding Brigham Young University has been bringing to its students distinguished men and women in arts and letters. The lyceums, usually evening programs, are of cultural value. Forum assemblies, held each Thursday morning, feature speakers and artists who can offer students a better understanding of our contemporary civilization.

## **University Fees**

The University reserves the right to change these figures without notice.

All students who register will be expected to pay tuition and fees prior to or at the time of registration. Students are held responsible to pay the correct tuition and fees.

Approximately 70 percent of the cost of operating the University is paid from the tithes of the LDS Church. Therefore, students who are active Church members, or their families, already have made a monetary contribution to the operation of the University. To equalize this burden somewhat it is necessary to charge nonmembers a higher tuition. Even the higher total payment, however, does not cover the total educational cost of nonmembers of the Church.

### **Tuition and General Fees**

(Effective Fall Semester 1971)

Full-time students (9½ hours or over for undergraduate students; 9 hours or over for graduate students)

	First Semester	Second Semester	School Year
LDS Church Members	\$300	\$300	\$600
Nonmembers	\$450	\$450	\$900

Part-time students (9 hours or less for undergraduate students; 8½ hours or less for graduate students)

(The tuition and fees paid as a part-time student do not entitle one to health service, student activity privileges, or physical education suit and facility privileges.)

	<b>LDS Church Members</b>	<b>Nonmembers</b>
Minimum tuition and fees .....	\$ 60.00	\$ 90.00
3 credit hours .....	85.00	130.00
4 credit hours .....	110.00	170.00
5 credit hours .....	135.00	210.00
6 credit hours .....	160.00	250.00
7 credit hours .....	185.00	290.00
8 credit hours .....	210.00	330.00

A fraction of an hour is, for fee assessment purposes, counted as a full credit hour.

All part-time students enrolled in one or more of certain physical education classes must pay an additional \$5.00. Check with the University cashier for applicable classes.

The charge for noncredit courses or for auditing courses is the same as for credit courses. Noncredit courses taken by part-time students will be assessed on the basis of hours involved in lecture classes. For example, three hours of lecture a week would be considered three semester hours and would be charged for accordingly. Therefore, if a student were taking eight credit hours plus a non-credit class involving two or more lecture hours per week, he would be considered a full-time student and must register as a full-time student. For courses in which no lecture hours are involved—for example, dissertations and theses—tuition and fees will be charged based on hours being carried during the semester, as determined by the supervising professor.

All graduate students who are not regularly registered but continue to use University services or facilities (including consultation with a major professor) will pay the minimum tuition equivalent to two semester hours during each semester for which University services or facilities are used.

#### Registration in Evening Classes

All daytime students will be required to pay an additional fee of \$3.00 per credit hour (credit, noncredit, and audit) for all hours carried under the Evening Classes program. Failure to pay this fee on the day of registration or the day on which an evening class is later added will result in a \$2.50 late-fee charge.

#### Admission Application Fee

A \$15.00 nonrefundable application fee must accompany the admissions application, both to be submitted by specified deadline dates.

#### Late Registration Fee

Late registration fees are assessed all full-time and part-time students for failure to complete registration on scheduled dates. No exception is made, regardless of the reason for being late.

1. First five regular school days following the scheduled registration date .....
  2. After the fifth day following scheduled registration date .....
- |       |         |
|-------|---------|
| ..... | \$ 5.00 |
| ..... | 10.00   |

Late fees for part-time students are assessed at 50 percent of the rate for full-time students.

Any student whose check is dishonored by his bank will be charged a handling fee of \$5.00. If the check was for tuition, there will be an additional charge of the late fee in effect at the time the check is redeemed.

#### Refunds

In the event of withdrawal by a student, a refund will be made on the basis of a charge of \$10.00 (\$5.00 for a part-time student) even though the student does not complete registration or attend school, plus a per-day charge of three percent of the total tuition and fees paid or payable for the semester.

The days charged for will be the school days beginning with the first day of the semester in which classes were held following the date on which the student registered, to the day on which the student reported his withdrawal to the Office of the Graduate Dean, both days inclusive.

Late fees are not refundable.

Any refund due a student because of withdrawal from school will be made only by check, through the mail, three weeks from the date on which the student reported his withdrawal and surrendered his receipt or activity card to the Office of the Graduate Dean.

No refund will be granted to a student who is requested to withdraw for scholarship or other causes.

No refund will be made after August 31 of the school year in which payment was received by the University.

### Miscellaneous General Fees and Fines

Graduation fee, master's or doctor's degree (only 50 percent refunded if degree is not obtained) .....	\$20.00
Graduation reevaluation fee (for students who defer graduation beyond the anticipated date on the original Application for Graduation card) .....	2.00
Late application for graduation fee (for those who apply after December 15 for June commencement and after February 15 for August commencement) .....	3.00
Graduate student service fee (for graduate students using University facilities without formal registration for University classes) per semester .....	Minimum tuition
Identification photo (payable at Photo Studio) .....	2.00
Change of registration fee (for each change slip presented after the first two weeks of each semester) .....	5.00
Change of grade fee (unless the change is the responsibility of the University) .....	3.00
Exemption examination, to exempt a student from taking a required class:	
If examination is taken with a group .....	2.00
If examination is taken alone .....	5.00
Graduate Special Examination	
To update credit and/or transfer credit from a nonaccredited institution or from a foreign university whose academic standards are not known to the faculty at BYU. (See page 36, "Credits Certified by Special Examination.")	
Examination, repeat foreign language, for advanced degree .....	10.00
Duplicate activity card .....	4.00
Spouse activity card (nonrefundable) per semester .....	10.00
Transcript fee .....	1.00
(\$1.00 for first copy on every order, plus \$.50 for each additional copy)	
Automobile and motorcycle registration and parking fee:*	
Zone B	
Academic year .....	12.00
Second semester or Summer School .....	6.00
Second session, Summer School .....	3.00
Zone C	
Academic year .....	6.00
Second semester or Summer School .....	3.00
Second session, Summer School .....	1.50

\*Registration is mandatory and no fee is charged if student elects to NOT park on campus.

**UNIVERSITY FEES**

Zone D		
Academic year .....	.....	6.00
Second semester or Summer School .....	.....	3.00
Second session, Summer School .....	.....	1.50
Bicycle registration .....	.....	1.00
Traffic violation fines .....	.....	Variable, according to violation
Thesis binding (4 copies) .....	.....	11.00 to 15.00
Hold placed on credits for unpaid bill .....	.....	2.00
Records search fee .....	.....	1.00

**Fees for Instruction in Music and Speech**

For fees in special private instruction in music and speech see the general catalog, University Fees section. For fees in special speech consultation contact the speech clinic.

**Fees for Departmental Facilities and Services**

Education 569, 673—4 credit hours .....	.....	25.00
Education 568, 569, 673—2 credit hours .....	.....	15.00
<b>Nursery School:</b>		
Smith Family Living Center, with lunch .....	.....	49.50
Smith Family Living Center, no meals .....	.....	30.00
Ashton House, no meals .....	.....	30.00
Recreational Education 502 .....	.....	10.00
Sociology 524, 597 .....	.....	3.00

**Rentals**

Organ rental, one hour per day, per semester .....	.....	\$10.00
Each additional hour per day, per semester .....	.....	8.00
<b>Harpsichord, clavichord rental, one hour per day, per semester</b>		
Each additional hour per day, per semester .....	.....	8.00
Harp rental, one hour per day, per semester .....	.....	10.00
Each additional hour per day, per semester .....	.....	8.00
Piano rental, one hour per day, per semester .....	.....	7.50
Each additional hour per day, per semester .....	.....	6.00
Practice room without piano, one hour per day, per semester .....	.....	4.50
Each additional hour per day, per semester .....	.....	3.00
Recorder rental, per instrument, per semester, tenor and bass .....	.....	3.00
Recorder rental, per instrument, per semester, alto .....	.....	2.00
Recorder rental, per instrument, per semester, soprano .....	.....	1.00
Fine imposed on students who use rooms but have not paid the fee .....	.....	2.00
<b>Locker rental (McKay Building and Eyring Science Center)</b>		
1 semester .....	.....	1.50
2 semesters .....	.....	2.50
2 semesters and Summer Session .....	.....	3.00
Key deposit .....	.....	1.00
Replacement of lost key .....	.....	1.00

**Deposits**

Physical education padlock deposit (maximum refund, \$4.00) .....	.....	\$ 5.00
Industrial education .....	.....	1.00
Chemistry (each laboratory class) .....	.....	10.00

Aerospace Studies (all AFROTC students - \$.50 will be retained for flight insurance.) .....	14.00
Military science (all Army ROTC students) .....	14.00

## Student Personnel Services

The Student Personnel Services offer valuable assistance in the following areas that affect graduate students: academic standards, counseling service, foreign students advising, health services, student organizations and social life, and student publications.

### Dean of Students

The dean of students is director of the Student Personnel Services. He initiates and recommends to the President and the Administrative Council needed policies and procedures in student life. He administers the program and coordinates the agencies at work on student problems.

### Counseling Center

#### Counseling

It is the policy of Brigham Young University Counseling Center primarily to see students with a variety of problems (educational, vocational and personal-social problems) who can be helped in a relatively short period of time (about one semester). It is not the intent to engage in long-term and/or intensive psychotherapy, but rather to promote the adjustment of students within the University setting.

The staff of the Counseling Center is professionally trained in counseling psychology and related disciplines. Such training enables them to offer professional assistance with problems ranging from the selection of a major and vocation to rather intense emotional disturbance. Students utilizing the service can be assured of reliable professional assistance.

#### Testing Services

Tests of achievement, ability, interest, and adjustment are given to all students requesting them. The data from these tests are used as a basis for counseling in educational, occupational, and personal problems. The testing service provides psychological test data for the use of counselors and registration advisers; placement tests for various academic groups at the University; and assistance in the preparation, administration, and scoring of subject matter as requested by various departments of the University.

#### Occupational Information Services

A comprehensive, current collection of essential occupational information is maintained in the Counseling Center library. Current catalogs of major universities and technical schools are also on file. These materials are available to all students seeking information about particular vocational opportunities or information about employment in general.

### Foreign-Students Adviser

Services of the foreign-students adviser are available to all students from countries outside of the United States. All alien students are expected to clear with him. Foreign students coming to the University should report first to the Foreign-Students Office in the Abraham O. Smoot Administration and General Services Building.

### Student Health Service

The Howard S. McDonald Student Health Center accommodates the health services comprised of an out-patient clinic and an in-patient unit for cases requiring bed care. The center functions twenty-four hours daily, seven days a week, and is available to any regularly enrolled full-time student whose fees include these services for the semester in which he is registered. Students are seen by appointment Monday through Friday, 8:30 a.m. to 4:30 p.m. A doctor is on call after 4:30 p.m., on weekends, and holidays to see emergency cases. Summer students are included. Medical care for all eligible students is limited to the facilities and personnel in the health center.

The following services are provided, some of which require an additional charge and are supplied at special rates:

1. Consultation with general physicians and specialists, by appointment in the health center during regular clinic hours, 8:30 a.m. to 4:30 p.m. For physician appointments there is a \$2.00 charge. This includes a specialty clinic in orthopedics, general surgery, gynecology, internal medicine, chiropody, and ear, nose, and throat.
2. First-aid treatment at any time.
3. Immunization of all types. Minimum charge except for smallpox, diphtheria and tetanus.
4. Bed care in the health center as recommended by a physician at a minimum charge of \$28.00 per day.
5. Within the limits of its personnel and facilities and at the discretion of the director, the treatment of chronic disease suffered by students.
6. Limited care and treatment by nurses. (minimum charge)
7. Drugs on prescription of a physician. (minimum charge)
8. Special diagnostic laboratory tests. (minimum charge)
9. X rays for a nominal fee.
10. After-hour calls made by a physician in the clinic. The student pays for each call plus an emergency room charge.
11. Rental of crutches or other equipment. (minimum charge)
12. Immediate notification of parents or guardian by letter or by phone by the health center when a student is taken ill and requires hospitalization.
13. Physical therapy. (minimum charge)
14. Skin testing for allergies and tuberculosis. (minimum charge)

Services not available are these:

1. Major surgery or off-campus hospitalization or medical care.
2. Dental service.
3. Obstetric service.
4. Eye refractions, glasses, prostheses, hearing aids, etc.

In the instance where physical examinations are required for participation in certain courses or activities, the student is responsible for securing the necessary physical examination prior to the time that he registers for the course. Such examinations must be obtained by the individual at his own expense.

### Student Health and Accident Insurance Program

To complement the services of the McDonald Student Health Center a supplemental insurance program to take care of a student at school or away from school is offered to all full-time students. This voluntary program is fully endorsed by the University and provides for a wide range of medical services at minimal costs. Students not otherwise protected by a health insurance plan are urged to accept this excellent plan specifically designed for our students.

Information regarding the student health and accident insurance program along with information regarding insurance for dependents of married students may be obtained from the health center.

## University Standards

The maintenance of high standards of honor, integrity, and morality; of graciousness in personal behavior; of Christian ideals in everyday living; and the complete abstinence from alcohol, tobacco, and harmful drugs are required of every student. The maintenance of standards as stated is applicable on the campus, at home, or wherever the individual may be as long as he is in student status. Registration signifies a student's willingness to conform his life to these standards. A copy of the code of student conduct is available from the dean of students, A-209 ASB.

Any pronouncement of disciplinary measures made by the President of the University becomes a part of these regulations. Violations of these regulations make the offender liable to suspension or expulsion from the University.

## Veterans' Service

All veterans may have their military experience evaluated for credit by applying to the Office of Admissions and Records.

War Orphans Education Program information may be obtained by making application at the nearest Veterans' Administration Regional Office.

Information on Veterans' Educational Benefits and any verification of school enrollment may be obtained through Brigham Young University, Veterans Coordinator, A-229 ASB, Provo, Utah 84601.

## Religious Opportunities

Brigham Young University students have excellent opportunities for participation in religious activities. Among the means available are the following:

### Brigham Young University Stakes

There are ten Brigham Young University stakes. Each stake has a number of wards, usually between 200 or 300 members, organized specifically for students, providing maximum opportunity for active participation in the program of the Church. Spiritual growth and the development of a strong testimony are goals fostered by the stake and ward organizations, whose programs are closely integrated at all levels with that of the University.

All single students living away from home establish their membership records in one of the wards of the stake. Married students who attend the University and do not live in University housing, may elect to have their membership records either in a ward of one of the BYU stakes or in a nearby ward in which they reside. Membership records of students remain in BYU stakes until the students terminate their schooling at the Y.

### Religious Organizations

In addition to the stakes and wards on campus we have several organizations that are primarily religious in nature, but which also are social and service groups.

### Devotional Assemblies

Devotional assemblies, held each Tuesday, enable students to hear messages of spiritual power and depth from Church leaders. It is contemplated that during each year members of the First Presidency and of the Quorum of the Twelve Apostles will address the student body in the Tuesday devotional assemblies.

### Special Discussion Groups

Special discussion groups for graduate students are sponsored by the College of Religious Instruction. The discussions will involve basic philosophic issues that

are interdepartmental in nature. Graduate students of any department are invited and encouraged, to the extent of time available, to participate in these discussions either on a credit or a noncredit basis.

## Student Housing

Learning to live harmoniously with other people under the right kind of living conditions plays a vital part in a college education. Students living in groups, working, studying, and enjoying recreation together, gain much from each other. The conversations, good fellowship, and activities experienced in group living contribute to a person's whole development. Participation in democratic, self-governing living activities brings about a phase of education which can be gained in no other way.

The Office of Student Housing, established to assist students with their housing needs, is located in the Abraham O. Smoot Administration and General Services Building. All inquiries or administrative problems relating to housing needs should be referred to this office.

### Campus Housing

#### Residence-Hall Supervision

Each area of campus housing is organized under the supervision of a person with professional training and experience for this type of work. The residence-hall staff carries out a program designed to provide each student with experiences in democratic self-government, cultivating the responsibilities that go with maturity and independence, and learning the art and science of human relationships in working and living with others. The staff assists the student to achieve a sense of belonging and to develop social competence through planned social and recreational programs. Head residents are available for general counseling. They carry out the residence-hall program in cooperation with other University academic services.

#### Applications

A student who plans to enroll at the University and live in a University residence hall should make inquiry to the Office of Student Housing about a year in advance. A housing application form will be sent to each inquiring student. A \$10.00 application fee is required and should be enclosed with the completed application form when it is returned to the Office of Student Housing. A residence-hall assignment and appropriate agreement forms are prepared on a basis of the date of receipt of the application form by the housing office and are mailed in the late spring and early summer.

#### Acceptance to University Housing

The validating of any campus housing reservation is contingent upon the student's official acceptance and admission to the University. For admission to the University contact the Graduate Admissions Office, D-251 Abraham O. Smoot Administration and General Services Building.

#### Rental Agreements

A student planning to live in campus housing may expect to sign a rental agreement for the accommodations he will occupy. He should be prepared to live by the terms of this agreement once he has signed and returned it to the Office of Student Housing. Misunderstanding and financial loss can be avoided by a student if he will read and familiarize himself with the terms of the agreement before signing.

#### Graduate Housing for Men

Housing arrangements have been made for graduate students in a special

area of the new residence halls. The approximate rate, including meals, is \$825.00. A few single rooms are available at \$875.00.

#### **Apartment Living for Women**

Housing for women is provided in twenty-four Heritage Halls. These are apartment-type buildings. Each apartment consists of a combination kitchen-dining-study room arrangement, three bedrooms and a bath. In addition, there are large living rooms, a recreation room, a head resident apartment, and laundry and storage facilities in each building. Six girls occupy an apartment and live cooperatively, preparing their own meals. The apartments are completely furnished except for bedding, kitchen utensils, and dishes. The facilities are excellent and offer a high standard of living for college students. The approximate annual rate for these accommodations is \$340.00. Food is purchased cooperatively by the residents of each apartment.

Help in the homemaking experiences of budgeting, buying, meal planning, and the selection, care and construction of clothing is available from specialists who are assigned to Heritage Halls. In addition, a specialist is available to assist students in planning social activities, developing recreational skills, and learning wise use of leisure time.

Each woman student desiring to live on campus should consider carefully the type of accommodations desired in view of her economic needs, time available for activities within her housing situation, and type of experience desired. Agreements are made for the academic year, and moving from one type of accommodation to another during the year is difficult to arrange.

#### **Residence Halls for Men and Women**

Board and room services for men and women are provided in eight buildings known as Helaman Halls and six buildings in Deseret Towers. These buildings form a beautifully designed residence-hall development. The residence-hall buildings are conveniently grouped around an attractively planned and developed central building. Each residence hall accommodates 234 to 264 students, with two persons sharing each bedroom. In addition, living rooms, study rooms, central shower areas, recreational rooms, adequate laundry and storage facilities, and a head resident apartment are found in each building. These halls provide some of the best student living experiences offered on any university campus. The central building features spacious dining rooms and a snack bar, providing the excellent food service for which BYU is noted. This building also contains beautiful living rooms, recreational areas, administrative offices, and other management facilities such as mail rooms and laundry and dry cleaning pickup stations. The approximate annual rate for these accommodations is \$825.00. A few single rooms are available at an approximate rate of \$875.00

#### **Apartments and Homes for Married Students**

Family accommodations for 462 married couples and their children are provided in a housing development known as Wymount Terrace. All units in married-students' housing are assigned according to family size.

Wymount Terrace—which includes 24 residence buildings, an administration building, and 3 laundries—consists of 462 apartments. There are 108 one-bedroom units, 60 one-bedroom-study units, and 264 two-bedroom units, and 30 three-bedroom units. The monthly rental rates are approximately \$74.50 for the one-bedroom units, \$80.50 for the one-bedroom-study units, \$84.50 for the two-bedroom units, and \$98.50 for the three bedroom units. In addition each family pays for its electricity. Balconies or porches for all apartments open on courtyards. Apartments have bedrooms, an all-tile bathroom, a kitchen with modern appliances, including garbage disposal units, gas ranges, and electric refrigerators, and an attractively decorated living room.

The Residential Housing Office can assist those who desire to live off campus to find suitable apartments in the Provo community.

#### **Residential Housing**

All students living off campus are required to live in University-approved housing. The Residential Housing Department of the Office of Student Housing

maintains up-to-date listings of approved residences. This office is established to assist students upon their arrival in Provo to find suitable quarters if they desire to reside in the community.

Residential housing consists of apartments, rooms with kitchen privileges, board and room, and sleeping rooms located in homes in the community. These facilities are inspected by University representatives to see that they comply with established standards before they are approved for student occupancy. Through the cooperative efforts of landlords and the University, constructive action has been taken to raise the standard of student housing throughout the community. Before making any commitments for residential housing, students should make sure that the place in which they contemplate living has been approved by the University.

A student planning to reside in the community should expect to sign a student-landlord rental agreement form which will be furnished by the University Housing Department. He should be prepared to live by the terms of this agreement once it has been signed, and a copy should be returned to the Office of Student Housing. Misunderstanding and financial loss can be avoided if the student will read and familiarize himself with the terms of the rental agreement form before signing.

#### Rates

Rates for residential housing accommodations vary with the type of service provided; consequently, only a general indication can be given here. Sleeping rooms rent from \$20 to \$40 per month. Apartment accommodations run from \$30 to \$50 per month per student. Board and room is available at the rate of \$65 to \$80 per month. Apartments for married students can be obtained at a rate of approximately \$65 to \$130 per month.

#### Time of Arrival

Residence halls are not open to a student prior to the announced opening date, usually the day before freshman orientation. The University does not advise a student who is going to live in campus housing to arrive before that date. It is unwise for a student with nothing to do to live in a hotel or motel where there is no University supervision.

#### Food Service

Regular meal service is provided for students at three different cafeterias on campus. Two of these are operated as part of the board-and-room service of residence halls. It is possible for students living off campus to buy meal tickets at reduced prices and eat in these places. The one cafeteria is in the Ernest L. Wilkinson Center, where meals are served at reasonable prices either for cash or by reduced-rate scrip books. In addition, by contacting the Office of Student Housing, board-and-room students may participate in a supplemental food program costing approximately \$90 a year more than the regular board-and-room rates.

The University operates four snack bars: one in the Ernest L. Wilkinson Center, a second in the George Albert Smith Fieldhouse, a third in the Helaman Halls Cannon Center, and a fourth in Deseret Towers. Food is available through the day. Food also may be secured from vending machines located throughout the campus. Costs of meals and food service are kept as low as possible, consistent with sound operating management.

The University also operates a dairy products laboratory where milk, ice cream, and other dairy products may be purchased by students and faculty at very favorable prices. Students preparing their own meals find this service both desirable and economical.

# List of Courses

## General

### Semester System

Courses of study at Brigham Young University are offered and credit for satisfactory completion is granted on a semester basis.

### Course Numbering System

Course Number	Type of Course
500 to 599	Graduate courses open also to advanced undergraduate students
600 to 799	Graduate

### Credit-Hour Designation

The three-number code for credit hours, listed in parentheses following the course title, has the following significance:

First number:	Semester hours of credit
Second number:	Class hours of lecture, recitation, or seminar meeting per week or minimum hours of individual study required per week
Third number:	Laboratory hours required per week or hours of field study or individual research per week

### Abbreviations and Symbols

The following abbreviations and symbols are used in the List of Courses section:

Arr.	Class or laboratory hours arranged
ea.	Credit-hour designation applies to each course number listed
F.,S.,Su.	Fall or Spring Semesters or Summer Session
*	In departmental faculty listings, faculty member on leave
<input type="checkbox"/>	Course originating in one department which may count for credit in another department
R	Course which may be repeated for credit

### Cross-Referencing of Courses

Each course is listed completely only once in the catalog. If the course may count in another department, it is listed in abbreviated form in that department and is preceded by a special symbol, .

### Graduate Courses

No "D" credit can apply toward a graduate degree. Neither lower-division nor correspondence credit can be applied toward a graduate degree.

### Reservation of Right to Change Courses

At the time of printing of this catalog, the University intends to give the courses listed herein but reserves the right to eliminate or discontinue any of them or to add new courses.

### Listing of Professors

Professors listed under each department title include members of the graduate faculty only.

## Accounting

**Professors:** H. Andersen, Johnson, Orton, K. Skousen,\* J. Smith, R. Smith, Taylor (graduate coordinator, 348 JKB).

**Associate Professors:** Cameron, Garrison, Hubbard, F. Skousen, Woodfield (chairman, 350 JKB).

**Assistant Professor:** L. Anderson.

### Master of Accountancy Program

#### Admission

The professional degree, Master of Accountancy (M.Acc.) is offered by the Department of Accounting. The program is available to those with undergraduate degrees in accounting or in other departments if adequate supplementary work has been taken. The following courses or their equivalents must have been taken prior to entering the program or must be taken without being applied to the credits required in the Master of Accountancy program.

Acctg. 201, 232, 301, 302, 312, 342, 356	Comput. Sci. 230
Econ. 111, 112, 301 or 302	Math. 108
Bus. Mgt. 301, 321, 341	Stat. 221

If a student has not completed courses equivalent to Accounting 332, 412, 420, and 475, he will be expected to include these courses as part of his program.

In addition to the general requirements and as part of the admission requirements, each student is required to take the Admission Test for Graduate Study in Business. The examination is given several times during the year. Arrangements for the examination are made by writing to Admission Test for Graduate Study in Business; Educational Testing Service; Box 966; Princeton, New Jersey 08540.

Applications are available at the BYU Testing Office, Room B-238 ASB.

#### Requirements

Specific requirements for the Master of Accountancy degree include

1. The following courses in a thirty-two-hour minimum requirement. The courses are so arranged that the student can begin his program during any semester.

<b>Required:</b>		<b>Semester Hours</b>	<b>Semester Offered</b>
Acctg. 612	Managerial Cost Accounting	3	Fall
Acctg. 613	Seminar in Resource Allocation and Control	3	Summer
Acctg. 615	Controllership	3	Spring
Acctg. 632	Quantitative Analysis in Business	3	Summer
Acctg. 675	Theory of Accounts and Statements	3	Fall
Acctg. 691	Seminar in Research Methodology (Select during the first semester in the program)	1	F.S.Su.
Acctg. 692	Research Seminar (Select during the second semester in the program)	2	F.S.Su.
Bus. Mgt. 636	Human Relations	3	Spring
Bus. Mgt. 639	Business Policy I	3	Fall
 <b>One of:</b>			
Econ. 353	Money and Banking	3	F.S.Su.
Bus. Mgt. 668	Mgt. of Financial Institutions	3	Spring
Bus. Mgt. 690	Seminar in Financial Mgt.	3	Fall
		<hr style="margin-bottom: 5px;"/>	
		27	
	Electives	5	
	Total Minimum	<hr style="margin-bottom: 5px;"/> <hr/>	32

2. An oral examination which will be given to each newly accepted student within the first month of the program. The purpose of the examination is to help the committee determine the student's strengths and weaknesses and to guide him in the establishment of his academic program.
3. The successful passing, during the student's final semester, of a written comprehensive examination and a final oral examination. The written examination must be completed before the oral examination may be scheduled.

The regulations of the Graduate School as given elsewhere in this catalog will apply to the following: (1) admission to the Graduate School; (2) graduate credit for seniors; (3) transfer credit; (4) student load; (5) scholastic standards; (6) advisory committee; (7) English 99; (8) course outline and revision sheets; (9) amount and distribution of credit, except as modified above in regard to the total number of hours required; (10) thesis requirements, when the thesis is elected; and (11) final oral examination.

**Three-Year Master's-Degree Program.** The department also offers the Three-Year Master's-Degree Program. Students are permitted to enter this program at the beginning of their junior year in college and complete the program at the end of one year in Graduate School. Details of this program may be obtained from the coordinator of graduate studies in accounting.

#### Courses

401. **Special Problems in Accounting I.** (2:2:0) (Offered F.S. and alternate summers) (m) Prerequisite: Acctg. 302.  
Includes partnerships, joint ventures, consignments, installments, receiv-  
erships, estates and trusts, and statement of affairs.
402. **Special Problems in Accounting II.** (2:2:0) (Offered F.S. and alternate summers) (m) Prerequisite: Acctg. 302.  
Home office and branch accounts, business combinations, foreign ex-  
change, and parent and subsidiary accounting.
403. **Accounting for Nonprofit Organizations.** (2:2:0) Prerequisite: Acctg. 202  
or 301.  
Accounting concepts and methods applicable to governmental units, uni-  
versities, hospitals, and other nonprofit organizations.
421. **Advanced Tax Problems.** (3:3:0) (Offered F.S. and alternate summers)  
(m) Prerequisite: Acctg. 420.  
Advanced study of federal income tax, estate and gift taxes, and special  
problems in corporate taxation.
455. **Data Processing Systems.** (3:3:0) (m) F. Prerequisite: Acctg. 356.  
Principles governing design and installation of accounting systems and  
the selection of equipment for optimum performance in data processing  
cycles.
457. **Advanced Computer Programming.** (3:1:3) S. (m) Prerequisite: Acctg. 356.  
Emphasis on the solution of practical problems in data processing.  
Individual work on the University's computer and comparison of various  
computers in current use.
486. **Contemporary Professional Accounting Problems.** (3:3:0) Prerequisites:  
Acctg. 420; completion of or concurrent registration in Acctg. 465, 401, 402.  
Study in accounting problems with emphasis on problems encountered  
in professional examinations.
612. **Managerial Cost Accounting.** (3:3:0) F. Prerequisites: Acctg. 302, 412.  
Study of specialized areas in cost determination and cost allocation.
613. **Seminar in Resource Allocation and Control.** (3:3:0) Su.

- 615. Controllership.** (3:3:0) S. Prerequisites: Acctg. 302 and 412.  
 Profit planning, control techniques, interpretation of data, and policy formulation.
- 621. Tax Research and Planning.** (3:3:0) (Offered alternate semesters) Prerequisites: Acctg. 420 and preferably Acctg. 421.  
 Research and solving of tax problems using the tax code, regulations, and other sources.
- 632. Quantitative Analysis in Business.** (3:3:0) Su. Prerequisite: Acctg. 332.
- 665. Auditing Seminar.** (3:3:0) S. Prerequisite: Acctg. 465.  
 A study in auditing concepts and philosophy and of their application to modern auditing methods and techniques.
- 675. Theory of Accounts and Statements.** (3:3:0) F. Prerequisites: Acctg. 302, 412, 475.  
 History and development of accounting and financial statements, their meaning and interpretation. Problems in current accounting theory will be considered.
- 687. Seminar in Accounting and Reporting Problems.** (3:3:0) Su. Prerequisites: Acctg. 302, 420, 465, 475.  
 An in-depth study into the current accounting and reporting problems and their solutions.
- 691. Seminar in Research Methodology.** (1:1:0) F.S.Su. Prerequisite: approval of graduate advisory committee.  
 Seminar in research methodology used in accounting.
- 692. Research Seminar.** (2:2:0) F.S.Su. Prerequisite: approval of graduate advisory committee.  
 Seminar in current topics; includes writing a research paper in proper form.
- 693. Reading and Conference.** (1-2:1-2:0) F.S.Su.  
 Subject to be arranged with instructor.
- 696. Accounting Internships.** (1-3: Arr.: Arr.) Prerequisite: Acctg. 302. Recommended: Acctg. 465.  
 Practical on-the-job experience and training with industrial and public accounting firms.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.  
 This course number should also be used for continuing registration by students working on theses.

## Agronomy and Horticulture

**Professors:** Allred,\* Farnsworth, Laws (graduate coordinator, 271 WIDB), Walker (chairman, 275-A, WIDB).

### AGRONOMY

#### Requirements

The requirements for admission as a graduate major in agronomy, leading to the Master of Science degree, are the general requirements of the Graduate School and the previous completion of an undergraduate major in this field or a closely related field. Students with a major in chemistry, geology, or physics may be accepted for a Master of Science degree in agronomy upon completion of certain basic courses in the department.

A student preparing for graduate work in agronomy is urged to obtain a thorough knowledge of introductory physics, chemistry, botany, mathematics,

microbiology and geology. A student may be required to take additional undergraduate courses if found to be deficient in foundation courses.

Students receiving the Master of Science degree in agronomy must complete a research project and submit a thesis.

### Courses

- 511. Soil Physics.** (3:2:3) S. Prerequisites: Agron. 282; Math. 101 or 105; one semester inorganic chemistry (101 or higher). Laws  
Physical properties of soils and their effects upon air, water, and temperature in relation to soil management and crop production.
- 520. Saline and Alkali Soils.** (3:1:6) S. Prerequisites: Agron. 302, 305. Farnsworth  
Physical and chemical properties of saline and alkali soils, their diagnosis, reclamation and management for crop production.
- 560. Soil and Plant Analysis.** (2:0:6) F. Prerequisites: Agron. 305; Chem. 223. Laws  
Laboratory chemical analysis of soils and plant materials in soil fertility research.
- 598R. Agronomy Conference and Reports.** (1-2:1-2:0 ea.) F.S.Su. Walker  
Preparation and writing of reports on selected agronomic subjects.
- 605. Chemistry of Soil-Plant Relationships.** (4:3:3) S. Laws
- 607. Soil Physical Conditions.** (3:2:3) F. Laws
- 614. Advanced Soil Microbiology.** (3:2:3) F. Prerequisites: Agron. 305; Micro. 121; Chem. 223. Farnsworth
- 659. Advanced Plant Breeding.** (2:2:0) S. Allred
- 694R. Seminar.** (1:1:0 ea.) F.S.Su.
- 697R. Research.** (Arr. ea.) F.S.Su.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Animal Science

**Professors:** Cannon, Hoopes, Orme, Shumway (chairman, 375 WIDB), Wallentine.

**Associate Professors:** Gardner, Park.

### Requirements

A student contemplating graduate study in animal science must have received his bachelor's degree in this field or have completed courses with an equivalent background. His undergraduate courses should have included approximately thirty-five hours taken from the following subjects or their equivalent:

- Micro. 121, 321, 331, 371, 501
- Bot. 101, 376
- Chem. 105, 106, 151, 223, 352, 384, 581
- Math. 105, 111, 109
- Physics 201, 202
- Stat. 221, 336, 337
- Zool. 203, 376, 417, 465, 483; Bio. Agr. Ed. 201

The student may select his minor field from among the following areas: agricultural economics, agronomy, microbiology, botany, chemistry, education, zoology, computer science, or statistics.

All students seeking a master's degree in animal science should enroll in Zool. 520 or Engl. 99, a noncredit course, "Problems in Thesis Writing."

### Courses

- Statistics 501. Statistics for Research Workers I.** (5:4:3)
- Statistics 502. Statistics for Research Workers II.** (5:4:3)
- 507. Animal Nutrition.** (3:3:0) S. Prerequisites: An. Sci. 207; Chem. 151 or equivalent. Recommended: Chem. 384. Gardner  
A study of the functions of nutrients in metabolism, measuring feed values, asserting nutrient requirements.
- 508. Animal Nutrition Laboratory.** (2:0:6) Prerequisite: completion of or concurrent registration in An. Sci. 507. Gardner  
Sampling methods, chemical analysis of feeds and blood, digestion trials, classical nutritional deficiencies, and research techniques are studied.
- 515. Advanced Animal Breeding.** (3:3:0) F. Prerequisite: An. Sci. 153 or a genetics course. Park  
Applications of genetic principles for livestock improvement. Emphasis on selection methods and mating systems.
- Statistics 531. Experimental Design.** (3:3:0) F.
- 560. Advanced Dairy Production.** (3:3:0) S. Gardner  
Includes the physiology and biochemistry of lactation, genetic improvement, dairy layout designs, disease control, nutritional requirements.
- 601. Experimental Animal Techniques.** (2:2:0) F.S.
- 660. Advanced Livestock Management.** (2:1:3) S.
- 691R. Advanced Topics in Animal and Meat Science.** (1-2:0:3-6 ea.) F.S.
- 692R. Seminar.** (1:2:0 ea.) F.S. (m)
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Anthropology and Archaeology

**Professors:** Christensen, Jakeman (graduate coordinator, 136 MSRB).

**Associate Professors:** Matheny, Myers (chairman, 150 MSRB).

**Assistant Professor:** Berge.

### Requirements

This department offers graduate study in archaeology only.

Admission to graduate study leading to the Master of Arts degree in archaeology ordinarily requires the previous completion of an undergraduate major in this subject. Upon admission, the student may be required to take additional undergraduate courses which the departmental faculty considers necessary to complete his background. Each student is also required to take a qualifying examination during his first semester of graduate work.

For the master's degree in archaeology at least fifteen semester hours of graduate credit are required in this subject, including Archaeology 500, 505, 510, 590R, and 671, unless these courses have previously been taken for undergraduate credit. The student must also complete at least one session of Archaeology 455R if he has not had the equivalent field experience. In addition, the student is required to complete nine semester hours of graduate credit in a minor field approved by the department.

A thesis suitable for publication is required of the candidate for the master's degree majoring in archaeology. It may be either a field report or an interpretative study.

The candidate for the master's degree in archaeology is required to pass the Graduate School Foreign Language Testing Program in German, French, or Spanish. If he desires to substitute some other language in fulfillment of this requirement, he must demonstrate its pertinency to his thesis subject. The candidate must also pass a comprehensive examination in archaeology administered by the department prior to pursuing thesis work. Examinations will be scheduled on an individual basis.

The Department of Anthropology and Archaeology is affiliated with the BYU-New World Archaeological Foundation, and this affiliation affords some graduate students opportunity for field experience in Mexico.

#### Courses

- 500. History and Theory of Archaeology.** (2:2:0) F. Christensen, Jakeman  
The development of archaeology, in general and in its various fields, as a scientific discipline.
- 505. Research Design.** (3:3:0) F. Prerequisite: consent of instructor. Matheny  
Orientation to research with emphasis upon interdisciplinary approaches to archaeological problems.
- 510. Classification of Material Culture.** (3:2:1) S. Matheny  
Systems and procedures of taxonomy for material culture with emphasis upon classification of ceramics.
- 541. Museum Studies.** (3:1:4) F. Berge
- 545. Advanced Near-Eastern and Mediterranean Archaeology.** (3:2:2) F. Prerequisites: Arch. 310 or Arch. 318. Christensen, Jakeman  
Recent developments and current problems in Near-Eastern and Mediterranean archaeological research.
- 555. Advanced Mesoamerican Archaeology.** (3:2:2) S. Prerequisites: Arch. 350. and Arch 355. Jakeman, Matheny  
Recent developments and current problems in Mesoamerican archaeological research.
- 590R. Seminar.** (2:2:0 ea.) S.
- 611. Introduction to Ancient Near-Eastern Iconography.** (2:1:2) F. Jakeman  
A study of the motifs and symbolism of Mesopotamian, Egyptian, Israelite, and other ancient Near-Eastern art.
- 631. Introduction to Mesoamerican Hieroglyphics and Iconography.** (2:2:0) S. Jakeman  
The motifs and symbolism of ancient Mesoamerican art, and the ancient Maya and Mexican writing and calendar systems.
- 651R. Advanced Field Methods of Archaeology.** (5:0:15 ea.) F.S.Su.  
Further in-service training in field methods at a current excavation.
- 671. Advanced Interpretative Methods.** (2:2:2) F.S. Berge  
Recent developments in theoretical concepts and quantitative techniques of handling archaeological data.
- 695R. Library Research.** (2:0:6 ea.) F.S.Su. Prerequisite: consent of instructor.
- 697R. Field Research.** (5-10:0:15-30 ea.) F.S.Su.  
Individual field research in an area of interest to the student.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Art

**Professors:** Andrus, Gunn (graduate coordinator, D-501 HFAC), Mathews, Turner.

**Associate Professors:** Breinholt (chairman, C-502-B HFAC), Darais, Magleby, Tippitts, Weaver, Wilson.

### Fields

1. Painting and sculpture.
2. Design (ceramics, crafts, commercial art, printmaking.)

### Requirements

A student expecting to major in painting and sculpture or design should have an adequate background in basic drawing, elementary design, and twenty semester hours of upper-division work including art history. A student may take both his major and minor in the Department of Art. When the applicant's file is completed in the Graduate School, it will be forwarded to the Art Department. The graduate art faculty will meet September 1 and January 1 to examine the files for acceptance. A quota admittance is part of the consideration. Applicants will be notified of the faculty decisions by mail. Applicants should also study the difference between the Master of Arts and the Master of Fine Arts degrees. Those electing the Master of Fine Arts degree must also prepare a portfolio of their art works to be deposited with the Art Department before September 1 and January 1 as a part of the faculty review for acceptance. Slides will be accepted for heavy or bulky works.

During the first full semester of graduate work the candidate is expected to (1) contact his sponsor listed on the acceptance form for orientation and to develop a committee consisting of a chairman in his major field of study and a committee member in the minor field (these names must also be approved by the Art Department graduate coordinator); (2) take the Graduate Art Department Examination which is offered each midsemester (date will be posted); and (3) prepare a course-of-study outline with the committee chairman on forms available from the Graduate School. If the graduate examination reveals a deficiency, an opportunity may be given to correct this deficiency. Remedial classes should be added to the course-of-study outline, but the credit will not be counted in meeting the Graduate School total credit requirements. A departmental qualifying examination is required of all graduate students in art.

Please review carefully the information listed under "Master's Degree" in the General Information section of this catalog.

### Master's Degree

The Art Department offers a Master of Arts degree. At least fifteen semester hours, exclusive of thesis, must be in one of the fields listed above, and at least nine semester hours in a minor field. A thesis and oral examination are required.

The Master of Arts degree in the Art Department is intended to stress the academic thrust. Thesis topics are expected to employ a problematic situation. Creative work within the M.A. thesis must be related to either a hypothesis or an analytic treatment of the creative works.

Firm deadlines are contained in the general section of this catalog and are also published by the Graduate School for course-of-study outline, thesis prospectus, thesis to graduate school, schedule of orals, etc.

### Master of Fine Arts Degree

The Master of Fine Arts is an applied or performance degree. A minimum of thirty-two semester hours is required in one of two areas: painting and sculpture, or design. A minimum of twelve hours is required in the other of these two areas, in addition to thesis credit of six to nine semester hours. The total of forty-four hours must include Art 629R, Advanced Design, and Art 690, Color. At least ten graduate or undergraduate hours of art history are also required. Under-

graduate classes in art history taken as graduate work to complete the requirement of ten hours may be included in the total credit requirement.

The schedule must be completed in residence within a period of five years with an average grade of B or higher at the end of each semester. The candidate's progress will be reviewed by the graduate art faculty. Toward the end of the third semester of his program the candidate will demonstrate his proficiency in his chosen field and a supporting creative field by means of a one-man exhibit of art produced during this program. This exhibit must be scheduled with the Art Department gallery director no later than the previous semester before the opening date. Before beginning the fourth semester of his program the candidate will submit to the graduate art faculty plans for a terminal MFA project. The project is a final work or works of art created by the candidate and, to be acceptable, it must represent a professional level of quality and the candidate's peak of achievement during his MFA program. It may be retained by Brigham Young University as part of its permanent collection. The date for the MFA project exhibit will be published by the gallery director. All graduating candidates will meet the same date for a group show. Project and report credit will be accepted in the total credit requirement.

Although a thesis is not required, an orderly record is necessary in which the MFA candidate traces, by means of personal statements, photographs, transcripts, news clippings, etc., his aesthetic development during his two years in the MFA program. It also should include a photographic record and scholarly account of the production of the candidate's terminal project. A more detailed account of the MFA report format is available in the Art Department office.

Candidates are expected to be alert to deadlines listed in the general section of this catalog and published by the Graduate School.

### Courses

- 444. Portfolio Preparation.** (2:2:2) S.F. Prerequisites: Art 122, 239, 341, 342. Gunn  
An analysis of individual strengths and weaknesses. Specialization opportunities provided in various areas of commercial design and display. Preparation of portfolio emphasized.
- 591. Philosophy of the Fine Arts.** (2:2:0) Recommended: Phil. 213 and any of the art appreciation classes or Hum. 101. Mathews
- 568R. Art Education Studio.** (3:1:5 ea.) F.S.Su.
- 580. Mural Design.** (2:2:2) F. Prerequisites: Art 227, 310, 321 or 322. Darais  
Historical backgrounds, studio work in design, and execution of murals.
- 582. Mural Painting.** (2:1:3) Prerequisite: Art 580. Magleby
- 595. Seminar.** (1:0:2) F.S.
- 621. Advanced Drawing and Painting.** (2:2:2) F.
- 624. Advanced Landscape Painting.** (2:2:2) F. Turner
- 625. Advanced Still-Life Painting.** (2:2:2) S. Turner
- 627. Pictorial Composition.** (2:2:2) F. Turner
- 633. Advanced Watercolor Painting.** (2:2:2) F.S. Turner
- 639. Advanced Layout.** (2:2:2) F. Gunn
- 642. Advanced Illustration.** (2:2:2) S. Gunn
- 650. Advanced Relief and Intaglio Printmaking.** (2:2:2) F. Andrus
- 652. Serigraphy and Color Lithography.** (2:2:2) S. Andrus
- 656. Advanced Sculpture.** (2:2:2) F.S. Johansen
- 664. Advanced Ceramics.** (2:2:2) F.S. Wilson

<b>666. Advanced Metal and Jewelry Design.</b> (2:2:2) F.S.	Weaver
<b>668. Art Education.</b> (2:2:0) S.	Gunn
<b>671. Survey of Recent Studies in Art Education.</b> (2:2:0) F.	Gunn
<b>674. Advanced Portrait Painting.</b> (2:2:2) F.S.	Andrus
<b>680. Advanced Mural Design and Painting.</b> (2:2:2) F.	Darais
<b>690. Color.</b> (2:2:0) F.	Andrus
<b>692. Color.</b> (2:2:0) S. Prerequisite: Art 690.	Andrus
<b>695. Seminar.</b> (1:1:0) F.S.	Andrus

The following courses may be repeated for credit. They are designed to offer a block of time for concentrated study toward maturity in one of the graduate art fields: (1) painting and sculpture, (2) design. A course-of-study outline must be prepared by the graduate student and his faculty adviser, and must include enough core breadth.

<b>568R. Art Education Studio.</b> (3:1:5 ea.) F.S.Su.	Gunn, Weaver, Wilson
<b>612R. Advanced Industrial Design.</b> (2:Arr.:Arr. ea.) Prerequisites: consent of instructor.	Stout
<b>622R. Advanced Figure Drawing.</b> (4:4:4 ea.) Prerequisite: Art. 621.	
<b>626R. Advanced Painting.</b> (4:4:4 ea.) Prerequisite: Art 621 or 624 or 625 or 674 or 676R.	
<b>629R. Advanced Design.</b> (4:4:4 ea.) Prerequisite: Art 310.	Darais
<b>635R. Advanced Watercolor.</b> (4:4:4 ea.) Prerequisite: Art 633.	Turner
<b>647R. Advanced Commercial Art.</b> (4:4:4 ea.) Prerequisite: Art 639.	Gunn
<b>653R. Advanced Printmaking.</b> (4:4:4 ea.) Prerequisite: Art 650.	Andrus
<b>658R. Advanced Sculpture.</b> (4:4:4 ea.) Prerequisite: Art 656.	Johansen
<b>665R. Advanced Ceramics.</b> (4:4:4 ea.) Prerequisite: Art 664.	Wilson
<b>667R. Advanced Crafts.</b> (4:4:4 ea.) Prerequisite: Art 666.	Weaver
<b>676R. Advanced Portrait and Figure Painting.</b> (4:Arr.:Arr. ea.) Prerequisite: Art 674.	Andrus
<b>682R. Advanced Mural Design and Painting.</b> (4:4:4 ea.) Prerequisite: Art 580 or 680.	Darais, Magleby
<b>699. Thesis for Master's Degree.</b> (6-9:Arr.:Arr.)	

## Asian Studies

**Professors:** Hillam, Hyer, Palmer (coordinator, 121 FOB).

**Associate Professor:** Farnsworth.

**Assistant Professor:** Britsch.

The Asian Studies graduate program is an interdepartmental and inter-college area program which, in combination with a major in one of the departments of the University (i.e., a regular academic discipline), leads to a Master of Arts degree. Students who are interested in Asia and who plan to continue toward doctoral studies, to teach, or to become involved at a professional level in Asia will find their needs best met by the double (concurrent) major program, which combines the advantage of the breadth of understanding which comes from an area program with the advantage of depth offered by a major in a single discipline. The Asian Studies graduate program also offers a minor to accompany regular departmental majors.

**Requirements**

The M.A. candidate will

1. Complete a major in one of the departments of the University (all departmental requirements must be fulfilled for the major).
2. Show a proficiency in an Asian language. Such proficiency will be demonstrated by examination.
3. Complete at least fifteen hours in approved Asian area courses at the graduate level from areas other than the department major and including two seminars in the Asian area.
4. Write a thesis on an Asian subject that is acceptable to both majors (Example: A student in history would write his thesis on Asian history).
5. In order to enter the program the student will be expected to have completed the usual graduate school requirements and to have strong undergraduate preparation in Asian Studies. Where deficiencies exist, the student, in consultation with his graduate committee, will be expected to remedy such deficiencies.

**Graduate Minor in Asian Studies**

Requirements:

1. Proficiency in an Asian language.
2. Nine hours of approved graduate level Asian courses.

**Courses****Economics**

- (3) 535. Economic Problems of Asia

**Geography**

- (2) 571. Problems of Asia

**History**

- (2) 640. The Far East  
(2) 648. Culture of Asia  
(3) 692. Seminar in Asian History

**Political Science**

- (3) 359. Modernization and Political Change  
(3) 551. Political System of China  
(3) 552. Political System of Japan  
(3) 558. Modernization and Political Change in Asia  
(3) 580. International Relations of Asia  
(1-3 ea.) 695R. Seminar in Foreign Governments and Comparative Politics (Asia)  
(1-3 ea.) 697R. Seminar in International Relations (Asia)

**Religion**

- (2) 555. Comparative World Religions (Asian)  
(2) 556. Comparative World Religions (Asian)  
(2) 559. The Church in Asia  
(2 ea.) 659R. Seminar in History of Asian Religion

**UNDERGRADUATE (Upper-division)****Art**

- (2) \*302. Oriental Art

**Anthropology**

- (3) \*350. Peoples of South and East Asia

**Asian Studies**

- (3) 499. Senior Seminar in Asian Studies

**Economics**

- (3) 430. Economic Development

**Geography**

- (3) \*470. Asia

**History**

- (3) \*340. Premodern Asia.
- (3) \*341. Modern Asia
- (3) \*342. Korea
- (3) \*343. Formative Period of Chinese Civilization
- (3) \*344. Modern China
- (3) \*345. Formative Period of Japanese Civilization
- (3) \*346. Modern Japan
- (3) \*347. India
- (3) \*349. Central Asia
- (3) 439. Russian Expansion into Asia
- (3) 440. Communist China

**Chinese (Mandarin)**

- (4) 301. Second-Year Chinese (Continued)
- (2) 311. Third-Year Conversation
- (3 ea.) 321, 322. Selected Readings and Composition
- (3 ea.) 421, 422. Readings in Chinese Social Sciences
- (3) 440. Historical Survey of Chinese Literature
- (4 ea.) 441, 442. Introduction to Classical Chinese
- (3 ea.) 443, 444. Modern Chinese Literature
- (3) 445. Chinese Civilization
- (1-3 ea.) 490R. Individual Study in Chinese
- (2) 495. Senior Seminar for Majors

**Japanese**

- (4) 301. Introduction to Japanese Literature
- (2) 311. Third-Year Conversation
- (3) 321. Third-Year Grammar and Composition
- (3) 322. Third-Year Grammar and Composition
- (3 ea.) 443, 444. Modern Japanese Literature
- (1-3 ea.) 490R. Individual Study in Japanese

**Religion**

- (2) \*453A. Mormonism and the World's Religions

\*Core courses for undergraduate major

## **Botany and Range Science**

**Professors:** Christensen, Harrison, Moore, Murdock, Stutz (graduate coordinator, 451 WIDB), Welsh.

**Associate Professors:** Andersen, Hess, Stocks (chairman, 499 WIDB), Vallen-tine, Weber, Whitton.

**Assistant Professors:** Brotherson, Rushforth, Tidwell.

**Collaborator:** Julander.

### **Requirements**

Students working toward a graduate degree in botany should have a basic understanding of general botany, cytology, anatomy, taxonomy, genetics, morphology, physiology, and ecology. Students working toward a graduate degree in range science should have a basic understanding of general botany, taxonomy, genetics, physiology, ecology, range management, range analysis, and animal nutrition and management. They should also have training in mathematics, chemistry, physics, microbiology, soils, and zoology adequate for advanced study in areas of specialization. Where deficiencies exist, provision must be made for correcting them.

A written diagnostic examination on undergraduate work is required of all graduate students and will normally be given during the first month after registration as a graduate student.

### Master's Degree

The requirements for the master's degree in botany or range science are those listed above and the general requirements of the Graduate School. The Master of Science degree is offered in botany and in range science under either Option I or II.

### Doctor of Philosophy Degree in Botany

In addition to the general Graduate School requirements for the Doctor of Philosophy degree, students in the Department of Botany and Range Science are required to satisfy the following special requirements:

One major area of specialization within the department is required. One minor area of specialization within the department, consisting of at least fifteen semester hours, and one minor sequence outside the department, consisting of at least fifteen hours, are required.

Students are usually required to complete a master's degree before undertaking the doctoral program.

The comprehensive examinations may be taken after at least one full year of graduate study and after the language examinations have been passed. The comprehensive examinations will consist of both written and oral examinations. These will explore thoroughly the student's background in the areas of botany, including basic undergraduate work.

Original research which makes a significant contribution to knowledge and a satisfactory dissertation are required.

## BOTANY

### Courses

501. **Histological Technique.** (2:0:6) F. (Offered 1971-72 and alternate years) Prerequisite: Bot. 101 or Zool. 105. Moore Techniques of preparing plant tissues for microscopic examination.
510. **Advanced Taxonomy.** (3:2:3) S.Su. Prerequisites: Bot. 110, 276, or consent of instructor. (One three-day field trip to be arranged.) Welsh
515. **Agrostology: Taxonomy and Ecology of Grasses.** (2:1:5) F. (Offered 1970-71 and alternate years) Prerequisite: Bot. 110. Harrison Classification and ecology of grasses. Important forage species are emphasized.
522. **Biological Instrumentation.** (3:1:6) F. (m) (Offered 1970 and alternate years) Prerequisite: graduate status or permission of instructor. Weber Theory and application of research instruments to biological problems.
525. **Ultrastructural Interpretation.** (3:3:0) F. (m) Prerequisite: Bot. 225, or Zool. 465 or 466 or Chem. 581. Moore, Whitton Study of ultrastructure and morphology of the cell.
535. **Advanced Mycology.** (4:2:6) S.Su. (Offered 1971-72 and alternate years) Prerequisite: Bot. 335 or equivalent. Weber A detailed study of taxonomy and morphology of special groups.
539. **Paleobotany.** (3:2:3) S. (Offered 1971-72 and alternate years) Prerequisites: Bot. 101 or 105; Geol. 103. Tidwell
550. **Plant Geography.** (3:2:3) F. (Offered 1971-72 and alternate years) Welsh The distribution of plant species and communities in the light of present and past climates.
557. **Experimental Ecology.** (2:0:6) S. (Offered 1970-71 and alternate years) Murdock Investigations on the phenology of selected species.

610. **Botanical Terminology and Nomenclature.** (2:2:0) F.Su. (Offered 1970-71 and alternate years) Prerequisite: consent of instructor. Welsh  
A detailed study of botanical terminology including the contributions of Latin and Greek words, their gender, number, and case.
620. **Cell Biology.** (3:2:3) F. (m) (Offered 1971-72 and alternate years) Prerequisite: Bot. 525; Chem. 581. Andersen  
A study of structure and physiology of cell membranes and organelles.
621. **Electron Microscopy.** (2:2:0) S. Hess  
Theoretical and practical aspects of electron microscopy of biological material, including electron diffraction, tissue preparation, replication, shadow casting of specimens and freeze-etch procedures as they apply to various sciences.
622. **Electron Microscopy Laboratory.** (1:0:3) S. Prerequisites: consent of instructor and Bot. 621 (or concurrent registration for Bot. 621). Hess
630. **Angiosperm Morphology.** (4:3:3) F. (Offered 1970-71 and alternate years) Prerequisite: familiarity with taxonomy, anatomy, and physiology or biochemistry. Tidwell  
A detailed study of the flowering plants with emphasis on relationships.
634. **Morphogenesis.** (3:2:3) F. (Offered 1971-72 and alternate years) Prerequisite: familiarity with taxonomy, anatomy, and physiology or biochemistry. Moore  
The development of form in organisms, with emphasis on plants.
638. **Advanced Mycology II.** (2:1:3) F.S. (Offered 1970-71 and alternate years) Prerequisite: a laboratory course in microbiology, botany, or zoology. Weber  
Advanced studies of fungi, with emphasis on genetics.
641. **Physiology of Fungi and Algae.** (4:3:3) F. (Offered 1971-72 and alternate years) Prerequisites: Bot. 335 and 440. Stocks, Weber
655. **Field Ecology.** (2:1:Arr.) S.Su. (Extended field trip.) Prerequisite: consent of instructor. Christensen, Murdock  
Ecological field work in forests and rangelands.
676. **Cytogenetics.** (3:2:3) F. (Offered 1970-71 and alternate years) Prerequisites: genetics and cytology. Andersen, Stutz
678. **Organic Evolution.** (3:3:0) S. Prerequisite: genetics or consent of instructor. Stutz
680. **Advanced Plant Pathology.** (3:2:3) F. (Offered 1971-72 and alternate years) Prerequisite: Bot. 480. Hess, Weber  
A detailed study of plant diseases and their causes, with emphasis on viruses, fungal pathogens, or nematodes.
- 691R. **Graduate Seminar.** (1:1:0 ea.) S.
- 698R. **Special Problems.** (1-3:0:3-9 ea.) F.S.Su.
699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.
740. **Advanced Plant Physiology I.** (3:2:3) S. (Offered 1971-72 and alternate years) Prerequisite: Bot. 440; Chem. 351. Harrison
741. **Advanced Plant Physiology II.** (3-4:2-3:3) S. (Offered 1970-71 and alternate years) Prerequisites: Bot. 440; Chem. 351. Stocks
742. **Plant Nutrition and Growth.** (3:2:3) F. (Offered 1970-71 and alternate years) Prerequisite: Bot. 440. Harrison
750. **Grassland and Desert Ecology.** (3:3:0) F. (Offered 1970-71 and alternate years) Prerequisite: consent of instructor. Christensen, Murdock
752. **Forest Ecology.** (3:3:0) F. (Offered 1971-72 and alternate years) Prerequisite: consent of instructor. Christensen, Murdock

760. **Conservation of Natural Resources.** (3:2:3) S. (Offered 1970-71 and alternate years) Prerequisite: consent of instructor.  
Christensen, Julander, Moore, Murdock
776. **Population Genetics.** (3:3:0) S. (Offered 1971-72 and alternate years)  
Prerequisite: genetics. Stutz
799. **Doctoral Dissertation.** (Arr.) F.S.Su.

### RANGE SCIENCE

#### Courses

- Agricultural Economics 520. Management of Ranch Resources.** (3:2:2) F. Pre-requisites: Range Sci. 365; An. Sci. 335 or 340; Agr. Econ. 325.  
Corbridge, Shumway, Vallentine
561. **Watershed Management.** (3:2:3) S. (m) Murdock
- 691R. **Graduate Seminar.** (1:1:0 ea.) S.
- 698R. **Special Problems.** (1-3:0:3-9 ea.) F.S.Su.
699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Business Education

**Professors:** Bell (graduate coordinator, 355 JKB), D. Peterson.

**Associate Professors:** Nelson (chairman, 351 JKB), B. Petersen, Polson, G. Smith, Stoddard, Waters.

**Assistant Professors:** Perry, H. Smith, Warner.

#### Admission

Entrance into the program is subject to approval by a departmental graduate faculty committee. A prospective graduate major is required to obtain departmental approval of his program before registering.

Applicants for the graduate program in business education may be admitted to the program either as regular degree-seeking students or on a provisional basis.

To be admitted as degree-seeking students, candidates must have received a baccalaureate degree and must have earned a 3.0 grade-point average in their latest sixty semester hours of undergraduate work. Applicants with a grade-point average between 2.5 and 3.0 in their last sixty semester hours of undergraduate work may, on the recommendation of the department, be admitted on a provisional basis. All students, whether admitted as degree-seeking students or on a provisional basis must earn a 3.0 grade-point average in all work to be applied toward a graduate degree.

Students admitted on a provisional basis must complete a minimum of twelve hours of graduate work in approved courses with a grade-point average of 3.0 or higher to become eligible for degree-seeking status. A maximum of sixteen hours of credit earned while on a provisional basis may be applied toward a master's degree.

Under some circumstances, applicants with a grade-point average below 2.5 in their last sixty semester hours of undergraduate work may qualify for admission to the graduate program in business education by completing a minimum of twelve semester hours of approved graduate work with a 3.0 grade-point average or higher. Courses selected for this purpose must be directly related to the field of business education and must be approved by the Department of Business Education.

Upon achieving regular degree-seeking status, the student will be assigned to a faculty sponsor and subsequently to an advisory committee by the director

of the department's graduate program. It will be the committee's task to assist the student in identifying an appropriate program of studies leading to the master's degree.

Requirements for the master's degree in business education include the following:

1. Successful completion of at least thirty hours of approved graduate study as follows:

Business Education .....	15 hours
Minor .....	9 hours
Thesis .....	6 hours
Total .....	30 hours

2. Satisfactory completion of requirements for a professional teacher's credential for public schools or junior colleges.
3. Presentation in final form of an acceptable research project.
4. Satisfactory defense of research project and evidence of adequate professional preparation by means of an oral examination.

A college-level writing course is also required of candidates for the master's degree. Business Education 320 (Report and Business Writing) or its equivalent, taken by a student either as a graduate or an undergraduate, may be substituted for English 99 (Problems in Thesis Writing).

#### Courses

**605. Introduction to Research in Business Education. (3:3:0) F.Su.**

An examination of research methods and procedures applicable to business education with emphasis on analysis and evaluation of methodology reflected in existing research.

**615. Methods of Instruction in Business Education: Typewriting and Shorthand. (3:3:0) F.Su.**

A critical evaluation of classroom methods, psychology of learning, and findings of research pertaining to improvement of instruction in typewriting, shorthand, and related subjects.

**620. Methods of Instruction in Business Education: Bookkeeping and Economic Education. (3:3:0) S.Su.**

An analysis of course content, classroom methods, and teaching materials pertaining to improvement of instruction in bookkeeping and economic education.

**625. Tests and Measurements in Business Education. (3:3:0) S.Su. Prerequisite: introductory statistics.**

A survey of tests and related instruments used to evaluate achievement in business education, and an analysis of their uses and methods of construction.

**630. Current Developments Influencing the Curriculum and Content of Business Education. (2:2:0) S.Su.**

A study of recent technological developments, such as automation in business, and an analysis of the content, materials, and procedures of business education.

**635. Implications of Research for Improved Classroom Instruction. (3:3:0) F.Su.**

Review and content analysis of recent research in business education, and evaluation of its implications for improved classroom instruction.

**640. Trends of Thought in Business Education. (2:2:0) F.Su.**

Fundamental ideas that have shaped the business curriculum in the United States and basic issues that affect purposes, trends, and control of business education in public and private institutions.

- 650. Supervision and Administration in Business Education.** (2:2:0) S.Su.  
A review of principles and practices related to the organization and direction of instructional programs in business education and to the selection and utilization of faculty.
- 655. Cooperative Business Education.** (2:2:0) F.Su.  
A study of the philosophy and objectives of cooperative office and cooperative distributive education programs with emphasis on their organization, coordination, and evaluation.
- 675, 676. Business Education Workshop.** (2-3:2-3:0 ea.)
- 690A,B,C,D. Seminar in Business Education.** (1:17:23 ea.) Su.  
Intensive one-week clinic emphasizing teaching methodology in one or more selected topics in business education.
- 692. Research Project.** (1-4:Arr.:Arr.) F.Su.
- 694. Independent Readings.** (1-2:1-2:0) F.S.Su.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Business Management

**Professors:** Christensen, Dyer, Moffitt, Nielson, Oaks, Taylor.

**Associate Professors:** Barnes, Call, Daines (director, MBA program, A-253 JKBA), Faerber, Garrison, Nelson, Pinney, Rickenbach, Stanford, Waters.

### Master of Business Administration

The Master of Business Administration program awards an MBA degree at the successful completion of a two-year graduate course of study. During this period a student will have earned sixty-four semester hours of graduate credit. The summer months are to be used at the discretion of the candidate, although work in industry is encouraged.

The major focus of the MBA is an integration of the managerial functions. Therefore, primary attention is given to the general management point of view. The central objective is to develop a decision maker who is prepared to take action after analyzing a problem and recognizing the alternatives open to him. The program centers on the basic skills and knowledge in the field of business administration rather than on specialized functional techniques. The multi-functional nature of management responsibilities implies the desirability of this orientation. Thus, the program provides learning experiences designed to help the student acquire knowledge, insight, maturity, and a sense of business ethics and social responsibility.

The curriculum attempts to fulfill this major task by utilizing the following basic stems of training: (1) administration, (2) environment, (3) operations, (4) quantitative-analysis, and (5) communications.

The administrative stem embraces principles of human behavior, group dynamics, human relations theory, and business policy. Operations involve production, marketing, and finance. In the quantitative stem a candidate receives an extensive and intensive exposure to mathematics, accounting, statistics, electronic computer programming, and operations research.

In the environmental stem one is involved with micro- and macroeconomics, business ethics, government and business, and international business. Finally, in the communications stem, a candidate considers and uses the written word in case analysis and the preparation of a major research document.

This program is demanding in terms of time and intellectual activity. The MBA candidate is expected

1. To use quantitative tools and scientific methods in analyzing the problems and policies of the economy and the individual business firm.
2. To communicate effectively.
3. To use sound analysis and perceptive interpretation of economic and social forces.
4. To work with people to achieve individual and organizational objectives.
5. To make sound decisions under conditions of uncertainty.

The MBA program is designed primarily for the nonbusiness major. Although the candidate will gain a general understanding of the functions and relationships of business, the primary objective of the MBA is to develop his creative problem-solving skill.

All applicants are required to take the Admission Test for Graduate Study in Business offered by the Educational Testing Service. Necessary arrangements may be made by writing to Admission Test for Graduate Study in Business, Box 966, Educational Testing Service, Princeton, New Jersey 08540.

#### Courses

610. **Managerial Economics.** (3:3:0) F.  
Analysis of the decision-making behavior of consumers and firms in a market economy.
611. **Written Analysis I.** (2:2:0) F.  
Written analysis of the characteristics of an administrative viewpoint.
612. **Quantitative Business Analysis I.** (3:3:0) F.  
Techniques of mathematics with special emphasis on applications to business situations.
613. **Management Computer Concepts.** (2:3:0) F.  
The development of electronic computer concepts and programming with a focus on the role of a computer in a business firm.
614. **Management Control I.** (3:3:0) F.  
Accounting as a tool for management; coordination of departmental operations; and control of assets.
616. **Organizational Behavior.** (3:3:0) F.  
A training laboratory experience devoted to the stimulation and support of administrative learning and change.
620. **Environmental Economics.** (3:3:0) S.  
Analysis of the measurement, level, and rate of growth of national income.
622. **Quantitative Business Analysis II.** (2:3:0) S.  
The use of probability and statistical inference in risk situations. The focus is on business problems.
623. **Management Simulation.** (1:0:3) S.  
Integration of functional areas of business and organizational behavior by use of computer simulation techniques.
624. **Management Control II.** (3:3:0) S.  
Accounting as a means of coordinating the operations of a business firm with market conditions.
625. **Marketing Management I.** (2:3:0) S.  
Imaginative problem solving in marketing management with the aid of business cases and readings.
627. **Production Concepts.** (3:3:0) S.  
Cases and readings on current production processes and problems.

- 628. Business Finance I.** (2:3:0) S.  
Development of the subject of finance from the point of view of the business manager. Emphasizes the use of financial statements and develops techniques and concepts for analysis of liquidity, profitability, and financial planning.
- 631. Written Analysis II.** (1:1:0) F.  
The preparation of a major topical research report drawn from first-hand industrial observation.
- 635. Marketing Management II.** (2:3:0) F.  
A strategic approach to product planning, pricing, consumer profiles, and market development.
- 636. Human Relations.** (2:3:0) F.  
Concepts of human relations theory with particular emphasis on group and intergroup conflict.
- 638. Business Finance II.** (2:3:0) F.  
Analytical approach to such financial management concepts as capital budgeting and investment decision making, valuation, reorganization, dividend policy, and long-range financial planning.
- 639. Business Policy I.** (3:3:0) F.  
A top-management approach to the problem of implementing corporate strategy.
- 641. Written Analysis III.** (2:3:0) S.  
An analytical critique and presentation of a major topical research report.
- 649. Business Policy II.** (2:3:0) S.  
A top-management approach to the problem of implementing corporate strategy.
- 652. Advanced Mathematical Analysis for Business Decisions.** (3:3:0) F.  
A study of quantitative decision models under certainty, risk, and uncertainty.
- 654. Controls III.** (3:3:0) F.  
Profit planning, cost analysis, and impact of federal income taxes on business decisions.
- 655. Business Research.** (3:3:0) F.  
Application of research techniques in solving specific problems in marketing and management.
- 657. Systems Analysis and Design.** (3:3:0) S.  
Analyzing the problems of planning, controlling, and improving systems.
- 658. Investments** (3:3:0) F.S.  
The principles and practice of investment, with special attention to investment analysis, elements of the investment process and markets, and criteria for investment decision. Problems of both individual and institutional investors will be considered.
- 659. Problems in Small Business Management.** (3:3:0) F.  
Consideration of management problems faced by founders, owners, managers, and investors in small businesses.
- 660. The Business Administrator and Government Policy.** (2:3:0) S.  
The impact of governmental policies and practices on a business administrator.
- 665. Management of Distribution.** (3:3:0) S.  
Sales organization; planning and control; selection and training of salesmen; supervision of decentralized operation.

**668. Management of Financial Institutions.** (3:3:0) S.

Review and analysis of the structure of our overall financial system to develop understanding of the primary forces which affect this system. Consideration of the major financial management problems of principal financial institutions.

**675. International Business Management.** (3:3:0) S.

Business decision making in other countries, with emphasis on financial reporting, personnel practices, production processes, and marketing channels.

**679. Business, Society, and the Individual.** (3:3:0) S.

Ethical concepts in business administration and the influence of business upon the individual and the total social environment.

## Chemistry

**Distinguished Professor:** Hall.

**Professors:** Anderson (graduate coordinator, 124 ESC), Blackham, Broadbent, Bryner, Butler, Castle, Goates, Gubler, Hawkins, Izatt, Nelson (chairman, 223 ESC), Ott, Snow, Swensen, Vernon.

**Associate Professors:** Bills, Bradshaw, Cluff, Mangum, Paul, Smith (biochemistry graduate coordinator), White, Wilson.

**Assistant Professors:** Dalley, Jensen, Mangelson, Pack, Thorne, Woolley.

The objectives of the department in the selection and training of candidates for advanced degrees are first, to assure adequate depth and breadth of knowledge; and second, to discover and develop ability to do independent and productive scientific research. The student's record in undergraduate courses will be accepted as partial evidence of the breadth of his knowledge. He will be expected to extend and broaden this knowledge by taking or auditing advanced courses selected with the approval of his advisory committee.

An entering graduate student will be expected to show proficiency in a foreign language (French, German, or Russian) or in mathematics beyond calculus, or in computer science. A working knowledge of one of these tools equivalent to that obtained from a year of study at the college level will be deemed to meet this requirement. A student with no proficiency in a foreign language will be considered deficient therein unless he elects the mathematics or computer science options.

A graduate student in chemistry is expected to meet all the general requirements for an advanced degree as outlined by the Graduate School. Special requirements of the Chemistry Department are given below. Graduate coordinators in the department will keep checklists of the student's progress toward a degree and will be available for consultation on details of Graduate School and department requirements.

Upon admission the student will be assigned a sponsor who will serve as his advisor until such time as an advisory committee is organized, ordinarily during the first semester. The advisory committee will be chosen by the student and the department chairman, or graduate coordinator of biochemistry, after the student has consulted with at least five faculty members.

The Chemistry Department relies upon its graduate students for many assignments in laboratory and recitation instruction. Unless a student is excused by the faculty, he will be expected to teach a cumulative total of at least two semesters at twenty hours a week during his residency toward the doctor's degree, half of which must come after his first year in residency. Master's degree candidates are expected to teach half this amount.

### Master's Degree

In addition to the general Graduate School requirements, a student must successfully complete a departmental appraisal examination before he will be accepted for the Master of Science degree in chemistry.

The department offers the three-year master's degree program (MA-3), wherein the student wishing to prepare for high school or junior college teaching may obtain the Master of Arts degree in chemistry. This program will normally begin at the end of the student's sophomore year. Details may be obtained from the chairman of the Chemistry Department.

### Doctor of Philosophy Degree

Departmental requirements for a Doctor of Philosophy degree include satisfactory completion of the following:

1. A written appraisal examination of the student's undergraduate preparation in chemistry. The student is advised to review thoroughly for this examination which will be given the week preceding his initial registration. If a student shows deficiencies in course work or this written examination he may be required to take appropriate undergraduate courses.
2. A major consisting of a minimum of twelve hours of course work chosen by the student and his advisory committee from those courses listed in the graduate catalog.
3. A minor consisting of a minimum of six hours of course work chosen by the student and his advisory committee from courses listed in the graduate catalog.
4. Successful completion of any of the foreign language requirement options as set forth by the Graduate School. In the two-language option, one of the languages must either be German or Russian.
5. Periodic examination and review of a student's progress to include written or oral examination. This review will also include the comprehensive examination.
6. A dissertation prepared under the direction of the candidate's advisory committee in which he reports and interprets the results of his research.
7. A final oral examination devoted primarily to the dissertation.

Area requirements for a Ph.D. degree in analytical-physical, physical, inorganic, organic, and biochemistry are available. Specific requirements for the Ph.D. degree in various fields can be obtained from the chairman of the Chemistry Department.

### Courses

504. **Instrumental Analysis.** (2:1:3) F. Prerequisite: concurrent or previous registration in Chem. 464.
514. **Inorganic Chemistry.** (3:3:0) S.
518. **Inorganic Synthesis.** (2:0:6) S. (Offered 1971-72 and alternate years)
521. **Analytical Chemistry.** (2:2:0) F. Prerequisite: Chem. 464.
522. **Analytical Chemistry Laboratory.** (2:0:6) F.
524. **Quantitative Microanalysis.** (2:1:3) S. (Offered 1972-73 and alternate years)
551. **Systematic Identification of Organic Compounds.** (3-4:2:3-6) F.
552. **Advanced Organic Chemistry.** (3:3:0) S.
561. **Chemical Thermodynamics.** (3:3:0) F. Prerequisite: Chem. 462.
562. **Advanced Chemical Thermodynamics.** (2:2:0) S. (Offered 1971-72 and alternate years) Prerequisite: Chem. 561.
564. **Nuclear and Radiochemistry.** (2:2:0) S. (Offered 1971-72 and alternate years) Prerequisite: Chem. 462.

- 565, 566. **Modern Physical Chemistry.** (2:2:0 ea.) F.S. Prerequisite: Chem. 462.
581. **Biochemistry.** (4:4:0) F. Prerequisite: Chem. 352.
584. **Biochemistry Laboratory.** (2:0:6) S. Prerequisite: completion of or concurrent registration in Chem. 581.
- 594R. **General Seminar.** (½:1:0 ea.) Required of all senior and graduate students in chemistry every semester in residence.
598. **Special Problems.** (Arr.) Registration by permission.
600. **Directed Teaching in Chemistry.** (1:1:0) F.S.Su.
601. **Geometry of Atoms and Molecules.** (3:3:0) S.
611. **Chemistry of Main Group Elements.** (3:3:0) S. (Offered 1971-72 and alternate years)
612. **Chemistry of Transitional Elements.** (3:3:0) S. (Offered 1972-73 and alternate years)
658. **Organic Synthesis.** (3:1:6) (Offered Spring 1972 and every third semester)
663. **Reaction Kinetics.** (2:2:0) F. (Offered 1971-72 and alternate years)
681. **Biochemistry of Lipids.** (2:2:0) S.
682. **Biochemistry of Nucleic Acids.** (3:3:0) S.
683. **Biochemistry of Carbohydrates.** (2:2:0) F.
684. **Biochemistry of Proteins.** (3:3:0) F.
- 697R. **Master's Candidate Research.** (Arr. ea.)
699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.)
719. **Selected Topics in Inorganic Chemistry.** (1-3:1-3:0)
725. **Electro-Analytical Chemistry.** (3:3:0) F. (Offered 1972-73 and alternate years)
729. **Selected Topics in Analytical Chemistry.** (1-3:1-3:0)
751. **Mechanisms of Organic Reactions.** (3:3:0) (Offered Spring 1971 and every third semester)
757. **Chemistry of Natural Products.** (3:3:0) S. (Offered 1971-72 and alternate years)
758. **Heterocyclic Compounds.** (3:3:0) S. (Offered 1972-73 and alternate years)
759. **Selected Topics in Organic Chemistry.** (1-3:1-3:0)
761. **Statistical Mechanics.** (3:3:0) S. (Offered 1972-73 and alternate years)
765. **Quantum Chemistry.** (3:3:0) F. (Offered 1971-72 and alternate years)
766. **Quantum Chemistry.** (2:2:0) S. (Offered 1971-72 and alternate years)
769. **Selected Topics in Physical Chemistry.** (1-3:1-3:0)
782. **Mammalian Biochemistry.** (3:3:0) S. (Offered 1973 and alternate years)
789. **Selected Topics in Biochemistry.** (1-3:1-3:0)
- 797R. **Doctoral Candidate Research.** (Arr. ea.)
799. **Dissertation for the Ph.D. Degree.** (Arr.)

## Child Development and Family Relationships

**Professors:** Cannon, Knowles, Moss (chairman, 1239 SFLC), Porter.

**Associate Professors:** Allred, Laws, Mead, Price, Rollins (graduate coordinator, 203-C SFLC).

**Assistant Professors:** Burr, Cutler, Hoopes, Scoresby, Vance.

### Fields of Study for Graduate Degrees

The department offers training which leads to the Master of Science degree in either of two specialized fields of study: (1) child development and (2) family relationships. The Doctor of Philosophy degree is offered in three specialized fields of study: (1) child development, (2) family relationships, and (3) marriage and family counseling. Students who make application for graduate work in this department must indicate on the application form one of the specialized fields to pursue as their academic major. The student who majors in a field within the department must select at least one minor field from another department offering graduate work unless the Option II program (for M.S. only) is followed requiring no minor field. Students entering a master's degree program with plans to later pursue the doctoral degree in either child development or family relationships are advised to select a minor field in one of the basic behavioral science disciplines. The Option II program permits students majoring in child development at the master's level to obtain an emphasis in early childhood education. The Option II major in family relationships permits an emphasis in family life education or marriage and family counseling. (Information about Option II programs may be obtained from the CDFR coordinator of graduate programs.) Graduate students in other departments of the University may select a minor from one of the fields indicated above. Courses for the graduate minor shall be outlined in consultation with a member of the department graduate faculty.

### Background of Courses Required for a Master's Degree in CDFR

Those students who choose **child development** as a major field will be expected to have completed the following courses or their equivalent as background for or in addition to the graduate program outlined by their committee: CDFR 322, Creative Experiences with Children; or 323, Organization and Planning for Preschool Programs; CDFR 410, Advanced Child Development; an introductory statistics course which includes inferential statistics (i.e., Psych. 370, Soc. 320, Stat. 221, or Stat. 552 at BYU); a research methods course (i.e., Psych. 369); and an upper-division undergraduate course in personality or learning theory.

Those students who choose **family relationships** as a major field will be expected to have completed the following courses or their equivalent as background for or in addition to the graduate program outlined by their committee: CDFR 361, Family Relationships; CDFR 460, Marriage and Family Interaction; an introductory statistics course which includes inferential statistics (i.e., Psych. 370, Soc. 320, Stat. 221, or Stat. 552 at BYU); a research methods course (i.e., Psych. 369 or Soc. 397); and an upper-division undergraduate course in sociological theory.

CDFR 410 is a prerequisite to all graduate level courses in child development and must be taken during the first semester of residence. CDFR 460 is a prerequisite to all graduate level courses in family relationships and must be taken during the first semester of residence. All background courses should be taken during the first semester if possible. However, the statistics and research methods course may be taken during the second semester if the student has difficulty scheduling all of the background courses during the first semester.

### Application for Admission

Applications for admission to graduate programs in CDFR are submitted to the Office of the Graduate School dean in accordance with University policy. Completed applications received by the CDFR graduate admissions committee from the Graduate School are reviewed on April 1 of each year. Applicants will be notified as to the decision as soon as possible after April 15. If the allotment of new students for the following year is not filled by April 15, late applications will be

reviewed at a time convenient to the department. Students not meeting all of the background requirements for their major are normally admitted as **provisional students** until deficiencies are made up. Students whose grade-point average is below 3.0 may, in certain cases, be admitted on a **provisional basis**. Students not accepted for admission due to a late application may obtain a temporary permit to register as a non-degree-seeking student. However, credit obtained **will not** apply toward a graduate degree, and there is no guarantee that the completion of background courses will enhance chances of later acceptance into the department.

#### Advisory Committee

All graduate students admitted to provisional or regular degree-seeking status in CDFR will be assigned a sponsor at the time of their acceptance. The sponsor will assist them in their initial registration and professional planning. Each student is responsible to select an advisory committee as soon as possible after becoming acquainted with the graduate faculty and after selecting a research topic for the thesis or dissertation. The chairman of the committee should be someone interested in supervising the student's research project. The graduate program of each student is under the direction of the advisory committee. It is advantageous to the student to select an advisory committee as early in his program as is practical.

#### Master's Degree Requirements for a Major in CDFR

A master's degree in CDFR requires a **minimum** of thirty-two semester hours of credit in addition to any background courses that may be necessary. A minimum of twenty-three hours will be required in the major field and nine hours in the approved minor field.

A major in **child development** requires the student to include the following courses in the twenty-three hours (thirty-two for Option II) required for graduation: CDFR 611, 510, 511, 597R, 693R, and 699. CDFR 611 should be taken first (after completion of CDFR 410), as it is a prerequisite for other required courses. CDFR 693R is required for two semesters. The remaining seven hours in the major may be selected from any of the 400-, 500-, or 600-level courses offered in the department in consultation with the student's committee chairman.

A major in **family relationships** requires the student to include the following courses in the twenty-three hours (thirty-two hours for Option II) required for graduation: CDFR 664, 596, 661, 663, 692R, and 699. CDFR 664 should be taken first (after completion of CDFR 460) as it is a prerequisite for other required courses. CDFR 692R is required for two semesters. The remaining seven hours in the major field may be selected from any of the 400-, 500-, or 600-level courses offered in the department in consultation with the student's committee chairman.

Completion of an acceptable thesis for which a minimum of six hours of credit is given is required of all master's candidates. Five copies of the thesis are required by the department.

#### Master's Degree Requirements for a Minor in CDFR

A minor in child development or family relationships at the master's level has the following requirements, depending on the area of emphasis.

CDFR 410 is required as background before beginning work on the minor program in **child development**. The following courses are required: CDFR 611, 510 or 511, and five hours selected in consultation with a departmental adviser. CDFR 410 must be taken as a prerequisite for 611; 611 is a prerequisite for certain other 500- and 600-level courses. These two courses are offered on the block plan each Fall Semester to facilitate their completion early in the program.

CDFR 460 is required as background before beginning work on the minor program in **family relationships**. The following courses are required: CDFR 664, 661, and five hours selected in consultation with a departmental adviser. CDFR 460 is a prerequisite for 664 and must be taken first; 664 is a prerequisite for certain other 500- and 600-level courses. These two courses are offered on the block plan each Fall Semester to facilitate their completion early in the program.

**Doctor of Philosophy Degree**

To pursue and complete a program leading to a Doctor of Philosophy degree in one of the three fields of the department, a student shall complete the following steps:

1. Submit to the Office of the Graduate School dean the necessary papers to be considered for admittance. This must include a designation of the academic field (child development, family relationships, or marriage and family counseling) in which the student intends to major. When this application reaches the department office for consideration the student will be contacted to arrange an evaluation interview with members of the department graduate faculty. Where a meeting is not feasible, additional information about the student's background and academic goals will be requested by the department in written form. At the conclusion of the interview and evaluation by the department, the student will be informed by mail of his status, and appropriate forms will be forwarded to the Graduate School.
2. Students admitted on a provisional basis will remain on provisional until they have completed one semester of graduate work (nine to twelve hours) in the department. At the end of this semester the student's work will be evaluated, and, if acceptable, he may continue to pursue his degree. The student should anticipate taking those courses from the master's program for which he has no comparable course work. The specific program is worked out on an individual basis between each student and his committee.
3. A comprehensive oral and written examination will be given prior to the last two semesters of the student's program which covers his major and minor fields, research methodology and statistics, and one of the following areas (not a part of his major): child development, family relationships, or marriage and family counseling. Before taking his comprehensive examination the student must complete his foreign language requirements. The approved departmental computer science program may be substituted for one of the languages. A combination of courses in mathematics, statistics, and computer science may be used to complete the total foreign language requirement.
4. A final requirement is the presentation and defense by the student of the acceptable dissertation before a committee formally appointed by the department. The student is required to register for a minimum of eighteen credit hours for this dissertation. Five copies of this dissertation are required by the department. (Further details about requirements and deadlines are available in the General Information section of the Graduate Catalog.)

**Courses**

510. **Physical and Intellectual Development of Children.** (2:2:0) S.Su. Prerequisite: CDFR 410, 611. Price  
A systematic survey of current theories and research on physical and intellectual development from conception through adolescence.
511. **Emotional and Social Development of Children.** (2:2:0) S.Su. Prerequisite: CDFR 410, 611. Rollins  
A systematic survey of current theories and research on emotional and social development from conception through adolescence.
- 520R. **Workshop in Child Development.** (1-2:1-2 wks.; 8 hrs./day:0 ea.) Su. Pre-requisite: 8 hours in CDFR or consent of department chairman.  
Intensive study in the application of principles of child development and child guidance.
540. **Introduction to Marriage and Family Counseling.** (3:3:0) F.S.Su. Prerequisite: CDFR 460. Recommended: CDFR 461. Allred, Hoopes, Laws, Mead, Scoresby  
Theories and techniques used in marriage and family counseling. Consideration of individual and group counseling as it pertains to the family.

- 550R. **Workshop in Marriage and Family Counseling.** (1-2:1-2 wks; 8 hrs./day:0 ea.) Su. Prerequisite: 8 hours in CDFR or consent of department chairman.  
Intensive study in the application of principles of marriage and family counseling.
- 560R. **Workshop in Family Relationships.** (1-2:1-2 wks.; 8 hrs./day:0 ea.) Su. Prerequisite: 8 hours in CDFR or consent of department chairman.  
Intensive study in the application of principles of family relationships.
566. **Materials and Procedures in Family Life Education.** (2:2:0) Su. Pre-requisite: consent of instructor. Moss  
An evaluation of materials, resources, and procedures in teaching family life education in the high school.
570. **Community and Professional Responsibilities to Children and Families.** (2:2:0) S.Su. Prerequisite: CDFR 410 or 460. Knowles, Moss  
Acquaintance with resources of the community as they relate to the welfare of children and families. A consideration of the responsibilities of professional persons working with children and families.
575. **Parent Education.** (2:2:0) F.Su. Prerequisite: CDFR 410 or 460. Knowles  
Basic principles in organization of parent study programs. Formulation and presentation of programs for parents.
590. **Readings in Child Development and Family Relationships.** (1-2:1-2:0) F.S.Su. Prerequisite: CDFR 410 or 460; consent of instructor.
595. **Special Topics in Child Development and Family Relationships.** (1-2:1-2:0) F.S.Su. Prerequisite: CDFR 410 or 460; consent of instructor.
596. **Research Problems and Methods in Family Relationships.** (2:2:0) S.Su. Prerequisite: CDFR 664. Rollins  
Analysis of strategic research areas in family relationships and research methods pertinent to their exploration. Students will formulate a research project.
- 597R. **Research Problems and Methods in Child Development.** (2:2:0 ea.) S.Su. Prerequisites: CDFR 410, 611. Vance  
Analysis of strategic research areas in child development and research methods pertinent to their exploration. Students will formulate a research project.
611. **Current Concepts and Research in Child Development.** (2:2:0) F.Su. Pre-requisite: CDFR 410. Price, Vance
616. **Measurement Techniques in Child Development.** (2:2:1) Su. Prerequisites: CDFR 510, 511; consent of instructor. Vance
623. **Curriculum Development in Preschool Education.** (2:2:2) F.Su. Pre-requisites: CDFR 323, 422; Ed. 301A. Vance  
Comparison and evaluation of various preschool curricula; examination of research in preschool curricula; application of preschool curricular innovations; application of criterion tests related to various preschool curricula.
649. **Systems Analysis for Marriage and Family Counseling.** (3:2:2) F.S.Su. Pre-requisites: CDFR 445, 540. Hoopes, Mead, Scoresby  
Application of principles of systems theory to develop strategies of intervention for use with ineffective marriages and families.
- 650A,B. **Practicum in Family Counseling.** (3:2:2-4 ea.) F.S.Su. Prerequisites: consent of instructor; CDFR 540. Allred, Hoopes, Mead  
Experience in organization and administration of family consultation with (a) young children and (b) adolescents.
- 655A,B. **Practicum in Marriage Counseling.** (4:1:6 ea.) F.S.Su. Prerequisites: CDFR 540; consent of instructor. Allred, Hoopes, Laws, Mead, Scoresby  
Supervised experience and sensitivity training in counseling of (a) marital dyads and (b) groups of marital dyads.

- 660. Dynamics of Parent-Child Interaction.** (2:1:2) F.Su. Prerequisite: CDFR 410 or 460.  
Rollins
- 661. Dynamics of Family Interaction.** (2:2:0) S.Su. Prerequisite: CDFR 664. Moss
- 662. Dynamics of Marital Interaction.** (2:2:0) F.Su. Prerequisite: CDFR 460.  
Rollins
- 663. Critical Problems in Family Life.** (2:2:0) S.Su. Prerequisite: CDFR 664.  
Cannon
- 664. Current Concepts and Research in Family Relationships.** (2:2:0) F.Su.  
Prerequisite: CDFR 460. Burr
- 667. Problems of Teaching Marriage and Family Relationships in College.** (2:2:0)  
Su. Cannon, Laws, Moss
- 685. Developmental Use of Play Experiences.** (2:2:0) Su. Prerequisite: consent  
of instructor.
- 692R. Seminar in Family Relationships.** (1-2:1-2:0 ea.) F.S.
- 693R. Seminar in Child Development.** (1-2:1-2:0 ea.) F.S.
- 697R. Independent Research.** (1-3:1-3:0 ea.) F.S.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)
- 740. Advanced Theories of Marriage and Family Counseling.** (3:3:0) F.S.Su.  
Prerequisite: CDFR 540. Allred, Laws, Mead
- 749. Supervision in Marriage and Family Counseling.** (2:1:2) S.Su. Prerequisites:  
CDFR 540, 649.  
Analysis and practice of techniques in the supervision of marriage and family counselors.
- 750. Advanced Practicum in Family Counseling.** (4:1:6-10) F.S.Su. Prerequisites:  
consent of instructor; CDFR 650R, 740. Allred, Mead  
Independent counseling experience within the scope and purpose of family counseling centers. The student serves as a senior counselor.
- 755, 756. Advanced Practicum in Marriage Counseling.** (4:1:6-10 ea.) F.S. Pre-  
requisites: CDFR 740; consent of instructor. Allred, Laws, Mead
- 760. Concepts and Theories of Marriage and the Family.** (3:3:0) F.  
Burr, Moss, Rollins
- 792R. Seminar in Family Relationships.** (1-2:1-2:0 ea.) F.S.
- 793R. Seminar in Marriage and Family Counseling.** (1-2:1-2:0 ea.) F.S.
- 794. Special Topics in Child Development.** (1-2:1-2:0) F.S.Su.
- 795. Special Topics in Family Relationships.** (1-2:1-2:0) F.S.Su.
- 799. Dissertation for the Ph.D. Degree.** (Arr.) F.S.Su.

## Communications

**Professors:** Bradley, Rich (graduate coordinator, F-563 HFAC), Smith, Wolsey.  
**Associate Professors:** Barrus, Beckham, Burnett, Richards (chairman, D-501 HFAC).

The Department of Communications offers an integrated program of graduate studies. The program's objectives are to prepare qualified students for responsible and creative leadership as mass communication specialists or as teachers in the field. It emphasizes general studies which have common application to a number of professional specializations, including newspaper and magazine editing and publishing, commercial broadcasting, educational broadcasting, advertising, public relations, and communications research.

### Admission

An applicant holding a bachelor's degree will be considered for admission to the program regardless of the undergraduate major, subject to the following requirements:

1. Evidence of a satisfactory level of ability in written and spoken English. A grade of "B" or above in Communications 211 or comparable studies will be considered suitable evidence of such ability.
2. Adequate undergraduate background in communications, normally including a minimum of fourteen semester hours in the following courses or equivalents: introduction to mass communications, news reporting, communications law, advertising, and broadcasting. Where appropriate, candidates will be required to pass departmental examinations on background work in these areas.
3. Adequate undergraduate background in the humanities and social sciences, including a minimum of twenty-five semester hours in five or more of the following areas: anthropology, economics, English, geography, history, languages, political science, psychology, and sociology.
4. Competence in a chosen specialization in communication, attained through undergraduate course work or experience. (Professional experience completed by an applicant will be evaluated with relation to possible equivalents among the foregoing requirements.)
5. A working knowledge of statistics sufficient to provide competence in conducting and evaluating communications research.

### Degree Requirements

The department offers studies leading to the Master of Arts degree in the field of communications. Candidates may elect programs of study under either Option I (major and minor) or Option II (major and supporting areas). A preliminary examination, thesis, and final oral examination are required of all candidates.

Students desiring to complete a graduate minor in communications should consult the chairman of the department regarding a recommended program of study.

### Courses

- 340. Broadcast News.** (3:2:4) F.S. Prerequisites: Commun. 255, 312. Recommended: Commun. 312, 372. Bradley  
News preparation and production of newscasts and public affairs programs. Consideration of interviews, documentaries, commentaries, editorials, and special events. Practical and lab experience provided.
- 371. Introduction to the Motion Picture.** (2:2:1) F.Su. Prerequisite: Physics 177 or equivalent. Goodman  
Introduction to documentary film theory, using films to illustrate technique and content. Overview of communication aspect of the cinema.
- 373. Motion Picture Writing.** (3:3:0) F.S.Su. Prerequisite: Commun. 211. S. Whitaker  
Basic fundamentals of screen script writing, from synopsis through screen treatment to final shooting script; analysis of theme and maturation action by reviewing films; aesthetics and script mechanics treated.
- 427. Magazine Writing.** (3:3:0) F.S. Prerequisite: Commun. 211 or consent of instructor. G. Barrus, Wolsey  
Planning and writing nonfiction articles for sale to periodicals. Analysis of magazine markets and criticism of articles written in the course.
- 439. Advertising Media and Campaigns.** (3:3:0) F.S. Prerequisites: Commun. 331, 333. G. Barrus, Wolsey  
Research and planning of advertising campaigns as related to national and local objectives; media selection and budgeting; individual project in production of an advertising campaign.

- 444. Broadcast Sales Administration.** (2:2:Lab. incl.) F.S. Prerequisites: Commun. 230, 255.  
The course is designed to develop the student's understanding of the complex interrelationships that are involved among various departments in order to handle professionally the sales administration of a broadcast facility.
- 449. Broadcast Programs and Audiences.** (3:3:0) F.S.Su. Prerequisites: Commun. 346, 347. Rich  
Observation and analysis of basic program forms used in radio and television; examination of effective program structure and appeals; consideration of audience situation and measurement.
- 456. Television Directing Workshop.** (3:3:3) S. Prerequisite: Commun. 346. Recommended: Speech and Dram. Arts 460.  
Theories and techniques of television directing.
- 458. Broadcasting and Film Performance Workshop.** F. (2:1:3) Prerequisites: Commun. 255; Speech and Dram. Arts 121, 123. McKinlay  
Laboratory and practical experience in performance of various types of broadcast and film productions; emphasis on performing under the disciplines of the studio setting.
- 480. Senior Seminar.** (3:3:0) F.S.Su. Prerequisites: Commun. 101; senior standing.  
Analysis of contemporary practices and problems of the mass media as social and business institutions; introduction to communications research.
- 510. Mass Media Administration.** (2:2:0) S.Su. Prerequisite: Commun. 312 or 439 or 449. Richards  
Problems of organization and administration for newspapers, magazines, radio stations, and television stations.
- 520. Editorial Writing and Interpreting Public Affairs.** (3:2:3) S. Prerequisite: Commun. 312 or consent of instructor. Burnett, Richards  
Study of the opinion and interpretative functions of the mass media of communication. Assignments in editorial writing and depth reporting.
- 526. School Yearbook Production.** (2:2:0) Su. (Offered 1970-71 and alternate years)  
Planning and supervising production of school yearbooks, including copy, illustration, layout, printing, binding, and business management.
- 528. Magazine Editing and Publishing.** (2:2:0) S. Prerequisite: Commun. 312.  
Principles of layout and design for magazines and business publications. Contemporary practices in content and production.
- 535. Public Relations.** (3:3:0) F.S.Su. Prerequisite: Commun. 211 or consent of instructor. Barrus, Bradley, Smith  
Philosophy and practice of public relations in business, governmental, educational, and other institutions. Study of publics, media, methods, press relations, and publicity.
- 536. Public Relations Case Studies.** (2:2:0) S. Barrus, Bradley  
Case studies in public relations. Cases are selected from a wide range of actual public relations problems which have confronted business, governmental, educational, and service institutions.
- 550. Problems and Practices in Educational Television and Radio.** (2:2:0) F.S.Su.  
Prerequisite: advanced standing in communications or graduate education. Rich, Williams  
A study of current problems and practices in the utilization and administration of television and radio in education and other noncommercial applications.
- 580. Comparative World Communication Systems.** (2:2:0) F.Su.  
Barrus, Burnett, Haroldsen  
Mass media systems in developing authoritarian and free nations. Relationship of these systems to government.

- 581. International Communication Problems.** (2:2:0) S.Su.  
 Barrus, Burnett, Haroldsen  
 An examination of the cultural, physical, and governmental barriers to the flow of information between nations. Role of the press in foreign policy. International propaganda.
- 610. Studies in Communication Theory.** (3:3:0) F.S.Su. Recommended: one or more courses in philosophy, psychology, and sociology. Rich  
 A study of the historical and philosophical development of communications theory, with special application to problems of the mass media.
- 611. Research Methods in Mass Communications.** (2:2:0) F.S.Su. Prerequisite: Stat. 221, or 552 or Psych. 370 or Sociol. 524. Bradley, Haroldsen, Smith  
 Research techniques in communication fields, including readership, readability, content analysis, and audience measurement. Introduction to thesis writing.
- 615. Propaganda, Public Opinion, and Communications.** (3:3:0) S. Burnett  
 Roles of the mass media as channels of propaganda and influences upon public opinion. Effects of public opinion on mass communication.
- 617. Mass Communications and Government.** (3:3:0) F.Su. Prerequisite: Commun. 307 or Pol. Sci. 361 or 563.  
 An examination of the contemporary relationship between government and the mass media, with attention to the philosophical and historical basis for regulation in light of constitutional guarantees.
- 620. Communication and Information Technologies.** (2:2:0) F. and alternate Su. Williams  
 Prerequisite: graduate standing.  
 Systems and technologies for encoding, transmitting, processing, and decoding information by electronic-mechanical means; analysis of computer use in new methods of interchanging print and other messages.
- 630. Advertising Planning and Research.** (2:2:0) S. (Offered 1970-71 and alternate years) Prerequisite: Commun. 439. Barrus, Wolsey  
 An analysis of methods employed to measure the effectiveness of advertising, with emphasis on pretesting techniques for advertising campaigns.
- 690. Seminar in Mass Communication.** (1:1:0) F.S.Su.
- 691, 692. Special Studies in Communication.** (1-3:Arr.:Arr. ea.) F.S.Su.  
 Individual work on approved problems not leading to a thesis. Projects must be approved before registration.
- 694. Readings in Mass Communication.** (1-2:Arr.:Arr.) F.S.Su. Prerequisite: consent of instructor.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Economics

**Professors:** Bateman, Clark, Crockett, Davies (graduate coordinator, 310 JKB), Doxey, Nelson.

**Associate Professors:** Rickenbach, Wimmer (chairman, 302 JKB).

**Assistant Professors:** Dutton, Foster, Koller, Pritchett.

While a student may be admitted on a provisional basis if he lacks certain prerequisites, for full graduate standing, a student in economics must have completed Economics 111, 112, 311 and 312 or equivalent; Statistics 221 or 321; and Mathematics 111, 112 or equivalent. ("D" credit is not acceptable in the above courses.)

The student must submit his scores on the Graduate Record Examination with the advanced examination in economics to the Department of Economics

before consideration can be given to his application for admission to the master's program. His major field of interest on the Graduate Record Examination must be designated "economics."

Any courses taken as an undergraduate need not be repeated.

There are three basic Master of Science programs in economics:

**Ph.D. Preparation—Option II**

	Graduate Credit
Economics 511 - Advanced Theory of Income, Employment and the Price Level	3
512 - Advanced Price Theory	3
588 - Econometrics	3
589 - Advanced Mathematical Economics	3
699 - Thesis for Master's Degree	6

Two of the following:

Statistics 421 - Theory of Statistics I	}	6
422 - Theory of Statistics II		
433 - Operations Research I		
434 - Operations Research II		

Computer

Science 331 - Computer Programming Language I	
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Mathematics 113 - Calculus II	0
214 - Analytic Geometry and Calculus III	0
385 - Linear Algebra	3

Electives from Graduate Catalog

English 99	0
Total	<u>30</u>

**Junior College Teaching—Option I or II**

	Graduate Credit
Economics 511 - Advanced Theory of Income, Employment and the Price Level	3
512 - Advanced Price Theory	3
415 - History of Economic Thought	3
474 - American Economic Development	3
699 - Thesis for Master's Degree	6
Education 640 - The Junior College	3
642 - Methods of College Instruction	3
644 - Directed Teaching in College	2

(A secondary teaching certificate may be accepted in lieu of these courses. Additional courses from the Graduate Catalog would be substituted.)

Minor - Normally a continuation of undergraduate minor or major.

English 99

Total	<u>30</u>
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**General Degree—Option I or II**

	Graduate Credit
Economics 511 - Advanced Theory of Income, Employment and the Price Level	3
512 - Advanced Price Theory	3

Two of the following:

Economics 415 - History of Economic Thought	}	6
474 - American Economic Development		
488 - Introduction to Econometrics		

Economics 699 - Thesis for Master's Degree

Electives in economics taken from Graduate Catalog

Either economics, a minor, or supporting fields (at least 5 hours from Graduate Catalog)

English 99

Total	<u>30</u>
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A graduate minor in economics must include Economics 311 and 312 or their equivalent if these courses have not been taken as undergraduate courses.

**Courses**

- 511. Advanced Theory of Income, Employment and the Price Level.** (3:3:0) F. (m) Prerequisites: Econ. 311, 312; Math. 112 or 109 or consent of instructor. Clark, Dutton, Foster  
An advanced course in the theory of income and employment. Considerable emphasis will be placed on the most recent advances made in this area of study. Journal articles will be extensively used.
- 512. Advanced Price Theory.** (3:3:0) S. (m) Prerequisites: Econ. 312 or 302; Math. 112 or 109 or equivalent. Bateman, Koller, Pritchett, Rickenbach.  
An advanced course in price theory which will use recent journal articles as a frame of reference for discussion periods.
- 530. Advanced Economic Development.** (3:3:0) S. Prerequisites: Econ. 311, 312, 430. Recommended: Econ. 488. Bateman  
The economic problems of a developing country are analyzed. Computer models are used to increase the student's awareness of the economic impact of fiscal and monetary policies.
- 558. International Trade and Finance.** (3:3:0) F. (m) Prerequisites: Econ. 311, 312 or equivalent. Recommended: Math. 112. Bateman, Doxey, Foster  
An analysis of international trade and finance.
- 563. Economics of the Labor Market.** (2:2:0) S. (m) Prerequisites: Econ. 111, 112, 361 or equivalent. Crockett, Davies  
Wage theory under competitive and noncompetitive conditions, the role of government, and labor market policies.
- 575. Theory of Public Finance.** (3:3:0) S. (m) Prerequisite: Econ. 312 or equivalent. Rickenbach, Wimmer  
An analysis of expenditures and taxation in the public sector.
- 588. Econometrics.** (3:3:0) S. (m) Prerequisites: Econ. 488; Math. 112 or equivalent. Bateman, Dutton  
A use of calculus, matrix algebra, and statistics to analyze quantifiable theorems of economic theory.
- 589. Advanced Mathematical Economics.** (3:3:0) F.S. (m) Prerequisites: Econ. 311, 312; Stat. 332 or 221; Math. 112 or equivalent. Dutton, Pritchett  
Application of mathematical tools to the quantifiable elements of economic theory.
- 590R. Advanced Economic Problems.** (1-3:Arr.:Arr. ea.) F.S.Su. Prerequisites: Econ. 311 and 312, or equivalent.
- 597R. Research.** (1-3:Arr.:Arr. ea.) F.S.Su.
- 601. Workshop on Economic Education.** (2-3:Arr.:Arr.) Su. Davies, Nelson
- 611. Seminar in Macroeconomic Theory.** (2:2:0) Dutton
- 612. Seminar in Microeconomic Theory.** (3:3:0) Dutton, Pritchett
- 615. Seminar in History of Economic Thought.** (3:3:0) S. (m) Prerequisite: Econ. 415 or consent of instructor. Crockett, Foster  
An advanced course in the development and evolution of the theoretical and institutional tools of economic analysis.
- 676. Seminar in Industrial Organization and Public Policy.** (3:3:0) Prerequisite: Econ. 476 or consent of instructor. Koller
- 689. Seminar in Mathematical Economics.** (3:3:0) S. (m) Prerequisites: Econ. 311, 312; Stat. 332 or 221; Math. 112 or equivalent. Dutton, Pritchett
- 691. Seminar in Economic History.** (2:2:0) S. (m) Prerequisite: Econ. 474. Doxey, Wimmer

- 693. Seminar in Comparative Economic Systems.** (2:2:0) S. (m) Prerequisites: Econ. 311, 312 or equivalent. Koller, Nelson
- 694. Seminar in Labor Economics and Labor Relations.** (2:2:0) S. (m) Prerequisite: Econ. 361 or consent of instructor. Crockett, Davies
- 695. Seminar in Urban Economics.** (3:3:0) F. (m) Prerequisites: Econ. 311, 312 or equivalent. Nelson, Rickenbach
- 697R. Research.** (1-3:Arr.:Arr. ea.) F.S.Su.
- 699. Thesis for Master's Degree.** (6-9: Arr.:Arr.)

## Education

**Distinguished Professor:** Romney.

**Professors:** Alley, Asay, Bauer, Belt, Berryessa, Black, Burrup, Callahan, Christensen, Clarke, Daines, Downing, Harris, Jensen, Morrill, Ovard, Reid, Smith, Van Alfen.

**Associate Professors:** Babcock, Baird, Barnett (emeritus), Bishop, Clark, Cottrell, Crandall, Cutler, Flandro, Harmon, Harms, B. Harrison, Holder, Hyatt, Kelly, Merrill, Moses, Muse, Ord, Pinegar, Rohde, Snow, Spencer, Sucher, Wilcox, Wilson, Winterrose, Wolfgramm.

**Assistant Professors:** Buckner, Dunn, Gale, Goodman, G. Harrison, Heaps, Hendrix, Herlin, Johnson, Moore, Thomas, Webb, Winward, Wootton.

The graduate program in the Education Area is organized to offer courses for all persons engaged in professional education and to offer service courses to graduate students in other disciplines.

Programs are designed to give special training to school administrators, school business managers, supervisors, curriculum directors, adult educators, junior college teachers and administrators, educational psychologists, school psychologists, specialists in counseling and guidance, teachers of special education, reading specialists and master teachers. Such programs are intensive and broad in scope. They are designed to give the depth and the breadth needed by specialists in education.

Programs are offered leading to graduate degrees at both the master's and doctoral levels. The Master of Arts and the Master of Education are offered. In addition, both the Doctor of Education and the Doctor of Philosophy are offered.

A program for the sixth-year certificate—Specialist in Educational Administration, Specialist in Curriculum and Instruction (both elementary and secondary), Specialist in Counseling and Guidance, Specialist in Special Education and Specialist in Reading—is offered for school superintendents, assistant superintendents, elementary and secondary school principals, supervisors, curriculum consultants, school counselors, reading specialists and special education coordinators.

A sequence of courses leading to junior college certification is also offered. Graduate students enrolled in a program leading to a master's degree in an academic subject matter area who complete the required professional education courses can meet junior college certification requirements in states where such requirements exist.

The graduate student is expected to meet all of the general requirements for advanced degrees as outlined by the Graduate School. The initiative for meeting these requirements rests with the student. Detailed descriptions of all masters, sixth-year, and doctoral programs in education are available through the Graduate Education Records office, 260 McKay Building.

### Master's Degrees

#### **Master of Arts**

1. Stat. 552—Statistical Methods in Education I. (Prerequisite)
2. Ed. 660—Research Design and Technical Writing in Education

3. Ed. 699—Thesis for Master's Degree
4. Major—At least fifteen hours
5. Related Fields—At least eight hours
6. Total hours—At least thirty-two hours

**Master of Education**

1. Ed. 551—Evaluation of Educational and Psychological Literature
2. Ed. 698—Field Project (taught as a class)
3. Major—At least fifteen hours
4. Related Field—At least eight hours
5. Total hours—thirty-two to thirty-eight hours

**Admission.** Admission to master's degree programs is contingent upon the following:

1. Compliance with admission requirements of the Graduate School.
2. A valid teaching credential or other acceptable preparation in professional education.
3. Evidence of the student's ability to do satisfactory work. (The student's ability to do satisfactory work is determined by the graduate education faculty on the basis of past academic record, recommendations, and scores on the following tests: (1) scholastic aptitude, (2) personality, and (3) English.)

**Thesis or Field Project.** The student must complete a thesis, including registration for Ed. 699, if he is seeking the Master of Arts degree. Ed. 698, Field Project, is taught as a regular class and is required for the Master of Education degree.

**Credit in Residence.** At least twenty-two semester hours toward the master's degree must be taken on the Brigham Young University campus in Provo.

**EDUCATIONAL ADMINISTRATION**

Although the master's degree in educational administration provides appropriate preparation for prospective school administrators in some states, those students seeking an administration credential in Utah and other states requiring a two-year graduate program should follow the sixth-year specialist or the doctoral program.

In the master's program, all students must complete a core of courses covering general administration, supervision, and research. Those include Ed. 551 (required, but does not count for hours toward major), 675, 677, 680R (not required of those who have had educational administrative experience), and 685, 698 or 699.

**Elementary.** Those interested in an elementary principalship should take, in addition to the above courses, Ed. 678.

**Secondary.** Those interested in a secondary principalship should take, in addition to the above courses, Ed. 679.

**Supervisors.** Those interested in school supervision should take, in addition to the above courses, Ed. 631 or 636.

**Minors.** Students minoring in educational administration should take Ed. 675, 677, 685, and a minimum of two or three additional hours in courses to be selected by the student and his adviser. Students minoring in junior college administration should take Ed. 640, 642, and 644.

**CURRICULUM AND INSTRUCTION**

Programs in these fields are designed to provide specifically for the needs of public school supervisors, directors of curriculum, master teachers in subject specialties, and other school personnel with particular interests in the instructional and curriculum areas.

Major students must complete a core of courses including Stat. 552 (M.A. degree only); Ed. 560, 660 and 698 or 699.

**Elementary Majors.** Those interested in elementary curriculum and instruction must take, in addition to the above courses, Foundations of Education (3-6 hrs.), Elementary School Methods (6-10 hrs.), and Ed. 631. (If desired, students may complete the elementary education program with emphasis in reading.)

**Secondary Majors.** Those interested in secondary curriculum and instruction must take, in addition to the above courses, Foundations of Education (3-4 hrs.), supplemental courses (3-7 hrs.), and Ed. 636.

**Minors.** Students minoring in elementary or secondary curriculum and instruction must take Ed. 631 or 636 and 626 or 534 and additional hours in curriculum and instruction courses to be selected by the student and his adviser.

**Instructional Media Majors.** Those interested in instructional media may choose an emphasis in media directorship or media production. The course program may be chosen from Ed. 506, 510, 520, 524, 526, 609, 610, 611, 680R, and 712, as well as supporting courses in education, library and information sciences, communications, or computer science. In addition, Ed. 698 and 551 or 660 are required.

**Reading Specialist.** Those interested in a reading specialist program should have three years' successful teaching experience. Course work includes Ed. 547, 560, 627, 628, 631, 632, 633, 637, 551 or 660, 667, 668, 670, 673, and 698. Other courses will be selected by the student and his committee.

## COUNSELING AND GUIDANCE

The master's degree in counseling and guidance is designed to prepare students for positions as school counselors. Students should have a suitable background of course work in a field such as psychology, sociology, or child development and family relationships.

Except with the written approval of the department, the student must have a valid teaching certificate prior to entering the master's program. Prerequisite courses to the graduate program are Psych. 111 and 450, and (M.A. programs only) Stat. 552.

Required courses are Ed. 550 (required but does not count toward total hours), 645, 646, 647, 651, 660, 671, 690A, 698 or 699, Psych. 550, and a minimum of two hours of electives approved by the committee chairman.

**Minors.** Students minoring in counseling and guidance are required to take Ed. 550, 645, and 646 plus one elective to be approved by the minor adviser.

## EDUCATIONAL PSYCHOLOGY

### Emphasis in Instructional Psychology

(Offered jointly with the Psychology Department)

**Program Outline:** (See chairman of educational psychology programs for more complete description.) A master's program should provide the ability to design, develop, and theoretically rationalize an instructional system designed to promote specific behavior changes in a specified population of learners, including procedures for revising the system for more effective outcomes. Competence is required in the following areas (courses suggested but not required):

1. Basic Principles of Learning and Instructional Psychology  
Ed. 659; Psych. 460, 560, 562
2. Statistics and Research Design  
Stat. 552, 554, or Psych. 370, 670
3. Measurement  
Ed. 560, or Psych. 378

4. Philosophy of Science  
Phil. 316
5. Educational Media  
Ed. 506, 570, 610, 712

**Internship.** Two semesters as development intern required. Most positions funded. Credit in Ed. 680R or Psych. 598R.

### SCHOOL PSYCHOLOGY

(Offered jointly with the Psychology Department)

To be admitted to this program, the student must present evidence of an appropriate background in psychology. For detailed academic requirements of the school psychology program, the student must check with the graduate secretary, 260 McKay Building.

### SPECIAL EDUCATION

In the graduate program in special education the student is prepared for work with children with intellectual, motor, visual, and emotional handicaps or learning disabilities.

All students majoring in this area must complete a basic core of courses and the required sequence of courses in one area of specialization or for the interrelated program. In addition, a student may choose a minor field or select courses in related fields approved by his advisory committee. Recommended courses are listed for each area of specialization.

Basic required courses are Ed. 260, 660, 690A,B,C,D, and 698 or 699.

Courses in areas of specialization are

**Mental Retardation.** Required: Ed. 361, 371, 567, 569, 570, 662, 667; Zool. 583 and Psych. 526. Recommended: Ed. 550, 565, 572, 657, 666, 669; Psych. 640, 642.

**Motor Handicapped.** Required: Ed. 363, 371, 566, 569A,B,C,D, 570, 667; Sociol. 580; Zool. 583. Recommended: Ed. 550, 565, 572, 665A,B,C, 666, 669; Speech and Dram. Arts 647.

**Visually Handicapped.** Required: Ed. 362, 373, 562, 563, 569A,B,C,D or E, 667; Zool. 364; Sociol. 580. Recommended: Ed. 570, 663, 666, 669.

**Emotionally Handicapped.** Required: Ed. 565, 568A,B,C,D,E, 569A,B,C,D,E, 572, 667, 668; Psych. 320 or 321, 440 or Ed. 657. Recommended: Psych. 240, 350, 365, 378, 450 or 550; Sociol. 360, 383, 552, 555; Ed. 647, 669.

**Remedial.** Required: Ed. 560 or 645, 570, 665A,B,C, 667, 668, 673, 674A,B. Recommended: Ed. 550, 572, 647; Zool. 583; Psych. 640.

**Interrelated Program.** (See Sixth-Year Specialist Program.)

**Minor.** Required: Ed. 260, 361, 565 or 567 or 570, 568A,B,C,D,E, 669.

### REQUIREMENTS FOR A MINOR IN PHILOSOPHY OF EDUCATION

The area of philosophy of education currently is organized to provide service courses for graduate students in other areas of the college and University. A minor in this field is provided for graduate students.

Graduate students enrolling in the area of philosophy of education are expected to take first the basic course, Ed. 601. Variations of this must be approved by the area advisers.

### Sixth-Year Certificate—Specialist in Education

The Education Area offers a sixth-year program in each of the following areas:

1. Educational Administration
2. Curriculum and Instruction

3. Counseling and Guidance
4. Special Education
5. Reading

Such programs are planned for the preparation of school superintendents, assistant superintendents, elementary and secondary school principals, supervisors, curriculum directors and consultants, school counselors and pupil personnel directors, reading specialists, and directors or supervisors in special education. Sixty semester hours of acceptable graduate work beyond the baccalaureate degree are required. In addition, all candidates must demonstrate proficiency in statistics of at least the level demanded by Stat. 552. (For detailed course work requirements the student should contact the secretary, 260 McKay Building.)

**Admission.** To be admitted into the program in full standing, the candidate must (1) present evidence of at least two years of successful professional experience; (2) achieve satisfactory scores on tests of (a) scholastic aptitude, (b) personality, (c) effectiveness of expression, and (d) general educational background; and (3) present evidence of a satisfactory academic background in the area of his intended field of preparation.

**Field Project and Report.** A research project for the improvement of a school program must be conducted under the direction of the student's advisory committee. The report of the field study must meet the usual standards of format and must be submitted under the same schedule and publication requirements as the thesis or the dissertation.

**Examinations.** A final oral examination is administered at the conclusion of the field project.

**Residence.** A student must establish residence by spending at least one full semester on campus.

**Transfer of Credit.** Ten semester hours of credit may be transferred from BYU off-campus centers. Students from other accredited institutions may transfer thirty semester hours from such institutions.

**\*Special Note.** Any student earning the Sixth-Year Specialist Certificate, without first securing the master's degree, will be awarded a master's degree based on his specialist work.

### Doctor of Education Degree

The Education Area offers work leading to the Doctor of Education degree in educational administration, curriculum and instruction, and counseling and guidance.

**Admission.** The battery of tests required for admission and the applicant's GPA will be used to determine provisional admission to the graduate program. The exams should be taken before the applicant arrives on campus. All first semester students will be assigned to take a two-semester-hour seminar. The seminar will be conducted by a team of faculty members representing subdivisions of the department. Various tests and examinations in English, writing, reporting, etc., will be conducted; personal interviews will be conducted; the MMPI will be administered. The seminar provides an opportunity for diagnosis of student strengths, weaknesses, and commitments. Vehicles for diagnosing include standardized and teacher-made tests and examinations in writing, reporting, speaking, and other communicative skills; personal interviews; personality tests; physical strength and stamina exercises. At the end of the semester the seminar faculty team will make recommendations to the faculty in the area relative to the program development needs of the student. In addition, students must have completed twenty-two hours of education or submit evidence of a valid teaching credential, must have at least two years of successful professional experience (in some programs this is a three-year requirement), and must possess adequate background in their intended areas of specialization.

**Course Work.** A minimum of seventy-five semester hours (exclusive of the field project) of acceptable credit beyond the baccalaureate degree is required

to complete the Doctor of Education degree. In addition, all candidates must demonstrate a reading proficiency in statistics of at least the level demanded by Stat. 554. (For detailed information on the statistics requirement, the student should check in 260 McKay Building.)

**A Final Oral or Written Examination.** At the completion of the course work an oral (or written) exam, which is largely diagnostic, will be given to determine areas where the candidate may be weak. The student will then register for one of two seminars in his major area of interest for the purpose of "filling in the gaps" in his field and completing his work in his major. It is believed that this seminar work might be done concurrently with the beginning work on the student's prospectus and field study.

**Field Project and Report.** A research project for the improvement of a program of administration or instruction must be carried out under the direction of the student's advisory committee.

**Residence.** At least two consecutive semesters of work, during each of which a student is registered for not less than nine semester hours, must be taken on the Provo campus.

### EDUCATIONAL ADMINISTRATION

The Education Area offers work leading to a Doctor of Education degree in educational administration with areas of special emphasis in

1. General School Administration
  - a. Superintendent
  - b. Assistant Superintendent for Curriculum
  - c. Assistant Superintendent for Teacher Personnel
  - d. Assistant Superintendent for Pupil Personnel
2. School Business Management
3. Elementary School Administration
4. Secondary School Administration
5. Junior College Administration

**Program Outline.** The doctoral program is designed to provide background in areas in which the student desires to specialize. The committee assigned, as a result of the seminar experience, will assume responsibility, along with the student, for the course work to be completed. The course work will represent an attempt to meet the expressed needs of the student and the identified needs as a result of the seminar experience.

### CURRICULUM AND INSTRUCTION

The Education Area offers work leading to a Doctor of Education degree in curriculum and instruction with areas of emphasis in

1. Elementary Curriculum and Instruction
2. Secondary Curriculum and Instruction

**Elementary Curriculum and Instruction** (sixty-three semester hours). This program will prepare the candidate for such positions as assistant superintendent in charge of curriculum and instruction, college instructor and supervisor of student teaching, subject matter supervisor or consultant, or curriculum consultant in an area of subject specialization.

**Secondary Curriculum and Instruction** (fifty-eight semester hours). This program will prepare the candidate for such positions as assistant superintendent in charge of curriculum and instruction, college instructor and supervisor of student teaching, subject matter supervisor or consultant, or curriculum consultant in an area of subject specialization.

### COUNSELOR EDUCATION

The Education Area offers work leading to a Doctor of Education degree in counseling and guidance.

## Doctor of Philosophy in Educational Psychology

The Education Area offers work leading to a Doctor of Philosophy degree in educational psychology with areas of special emphasis in

1. Counseling and Guidance
2. Special Education
3. Instructional Psychology

All first-semester doctoral candidates will be assigned to take a two-hour seminar. The seminar is to assist the student in determining his capability for doctoral-level study.

### Emphasis in Counseling and Guidance

**Admission:** Admission is based upon a formal application made through the Graduate School and the Division of Counselor Education. Selection for admission is based upon scores from selected tests, grade-point averages, letters of recommendation, and recommendations from the doctoral admissions committees.

**Program Outline:** The program of courses and experiences is sufficiently flexible to permit a variety of work for fulfillment of degree requirements. The criteria for successful completion of the program include demonstrated competencies. Required courses are augmented by electives through which needed competencies may be strengthened. Courses are also chosen in consultation with the student's committee according to areas of major interest and anticipated professional position.

**Areas of Emphasis:** Specialization is possible in (1) elementary school counseling and guidance, (2) secondary school counseling and guidance, (3) counseling psychology for higher education, (4) school psychology, and (5) related programs in business, industry, and the community.

**Program Courses and Experiences:** Detailed lists of required and elective classes and experiences are available from the chairman of counselor education.

### Emphasis in Special Education

**Admission:** Admission is based upon a formal application made through the Graduate School and the Institute for Special Education. Scores from selected tests, grade-point average, letters of recommendation, recommendations from the doctoral standards and admissions committee and a personal interview form the basis for selection of candidates to enter the beginning doctoral seminar.

**Program Outline:** Following successful completion of the doctoral seminar mentioned above, a program of courses and experiences is designed by the candidate in concert with his studies committee to complete fulfillment of degree requirements. The program has sufficient flexibility to provide a variety of avenues toward completion of degree requirements.

**Areas of Emphasis:** Specialization is possible in (1) mental retardation, (2) learning disabilities, and (3) neurological impairment. It is also possible to study interrelated subjects. Any of these areas may prepare the candidate for competency as a college instructor, program director (district or state level), or as a research specialist.

**Program Courses and Experiences:** Detailed lists of available recommended and elective classes and experiences are available from the chairman of the Institute for Special Education, 240 College Hall. All candidates are required to serve a minimum of one semester as interns in their area of study. (These internships provide varying stipends.)

### Emphasis in Instructional Psychology

(Offered jointly with the Psychology Department)

**Admission:** An applicant for this emphasis must file a separate application with the chairman of educational psychology programs. For funded internship,

application must be submitted prior to April 1 for summer, May 15 for fall, or Dec. 1 for spring. During first semester an applicant will select a sponsor from among the instructional psychology faculty.

**Program Outline:** (For more complete description see chairman of educational psychology programs.) The doctor's program should develop the ability to conceive, design, administer, analyze, interpret and report experimental investigations concerning the instructional process. Competence is required in the following areas (courses suggested but not required):

1. All those specified for master's in educational psychology with emphasis in instructional psychology
2. Theory and Principles of Learning and Instruction  
Ed. 661, 731; Psych. 562, 662, 795R
3. Experimental Design and Statistics  
Stat. 501, 531 or 502; or Psych. 370, 670, 671
4. Measurement Theory  
Psych. 678
5. Computer Language and Technology  
Comput. Sci. 230, 331; Psych. 570
6. Proposal Writing and Fund Seeking  
Ed. 660

**Language:** Statistics and a computer language (FORTRAN or PLI) are substituted for a foreign language.

**Internship:** One-half time for four semesters as a research intern is required. Most positions are funded. Up to four hours' credit per semester in Ed. 780R.

#### Courses

500. **Fundamentals of Adult Education.** (3:3:0) F.Su. Prerequisite: student teaching, teaching certificate or departmental approval.
506. **Instructional Media in the School Program.** (3:2:3) F. Su.  
Introduction to application of instructional media. Principles of evaluation, selection, utilization of instructional media. Develops skills in materials production. Attention given to utilization of instructional media centers.
510. **Media Production Techniques.** (2:1:3) F. Prerequisite: Ed. 506.  
An in-depth exploration of the various tools and techniques appropriate to the production of instructional materials.
- 514R. **Analysis of In-Service Problems.** (1-3:1-3:1 ea.)
515. **Analysis of In-Service Problems.** (1-3:1-3:1)
520. **Photography in Instruction.** (2:1:3) S. Prerequisites: Ed. 506; Commun. 363 or equivalent.  
The processes, techniques and equipment applicable to the preparation of photographic instructional materials.
524. **Art and Graphic Processes in Instruction.** (3:2:3) F. Prerequisite: Ed. 506 or consent of instructor.  
Preparation of instructional materials or reproduction masters using art and graphic processes.
526. **Instructional Use of Audio Programs.** (2:1:3) S.Su.  
Design, development and utilization of audio materials and systems for large and small group and individualized learning.
534. **Innovative Practices in the Elementary School.** (3:3:1) F.Su.
536. **Secondary Curriculum and Methods: Introduction.** (3:3:0) F.Su.  
Analysis of difference among the various curriculum and instructional patterns, emphasizing their impact on individualized learning.

**547. Foundations in Reading. (3:3:0) F.Su.**

A consideration of the various approaches to reading. A detailed study of readiness for reading and the different techniques of word recognition as developed in kindergarten through grade twelve.

**549. Directed Observation in the Secondary School. (2:0:4) F.S.**

Directed observation with secondary school pupils. Required for speech therapists who do not have secondary certificates; recommended for teachers who are recertifying and others.

**550. Introduction to Guidance Services. (2:2:0) F.S.Su. Home Study also.**

Principles and practices of pupil personnel services in the public schools. Designed for prospective teachers of both elementary and secondary levels. Required but may not be counted as part of the 30 hours for the master's degree by students majoring in this area of specialization.

**551. Evaluation of Educational and Psychological Literature. (2:2:0) S.Su.**

Research literature in education and psychology. Emphasis on interpretation. Application of nonempirical techniques by preparing prospects for field project.

**560. Educational Tests and Measurements. (3:3:0) F.S.Su. Prerequisite: Stat. 501 or 552 or Psych 670.**

Principles of test construction and use. Interpretation of standardized tests.

**562.\* Problems and Methods in the Education of the Visually Handicapped. (3:3:0)**  
Prerequisites: Ed. 362, 373.

Problems confronting administrator and teacher in the different types of school programs now available for the visually handicapped. Specialized teaching methods and materials.

**563.\* Advanced Braille. (2:2:0)**

Study of the "Nemeth Code of Braille Mathematics and Scientific Notation" and of transcription formats and techniques.

**565.\* Problems in the Education of Emotionally Handicapped Children. (3:3:1)**  
Prerequisite: Ed. 260, consent of instructor.

Organization of educational programs, curricular development and teaching methods for students with emotional problems.

**566.\* Problems in the Education of Orthopedically Handicapped Children. (3:3:1)**  
F.S.Su. Prerequisites: Ed. 260, 363.

Problems of identification, diagnosis and placement, organization of educational programs, curriculum development and teaching methods for students with orthopedic handicaps including the homebound and hospitalized.

**567.\* Problems in the Education of Mentally Retarded Children. (3:2:2) F.S.Su.**  
Prerequisite: Ed. 361.

Problems of identification, diagnosis and placement, organization of educational programs, curriculum development, and teaching methods for classes for mentally retarded students.

**568A,B,C,D,E.\* Observation and Participation in Special Education. (2:1:4 ea.)**  
F.S.Su. Prerequisite: consent of instructor.

A—Mentally Retarded; B—Orthopedically Handicapped; C—Visually Handicapped; D—Emotionally Disturbed; E—Hearing Impaired.

Observation and participation in classes for handicapped children. Designed to develop readiness for practicum experience. A laboratory fee of \$15.00 is charged, payable upon application for student teaching.

**569A,B,C,D,E.\* Practicum in Special Education. (2-4:0:5-10 ea.)** Prerequisite:  
consent of instructor.

A—Mentally Retarded; B—Orthopedically Handicapped; C—Visually Handicapped; D—Emotionally Disturbed; E—Hearing Impaired.

A laboratory fee of \$15.00 is charged, payable upon application for student teaching.

\*Course in area of special education.

- 570.\* Problems in Education of Children with Neurological Impairment.** (3:3:0) F.Su. Prerequisite: Ed. 260 or consent of instructor.  
Principles and special techniques and materials for teaching children with learning disabilities related to neurological impairment.
- 572.\* Educational Evaluation of Communication Disabilities.** (2:2:4)  
Principles and practices of evaluating communication disabilities of children with emphasis on prescribing education-habilitation procedures. Designed for graduate students in special education, speech pathology-audiology and other school specialists.
- 573.\* Workshop for Teachers of Bilingual Children.** (2:8 hrs./day for 2 weeks)  
Study of educational needs, materials, and methods appropriate to the background and language problems of bilingual students.
- 578. Practicum for Elementary Teaching.** (2-4-8:2-4-8:5-10-20)
- 579. Practicum for Secondary Teaching.** (2-4-8:2-4-8:5-10-20)
- 601. Comparative Current Educational Philosophy.** (3:3:0) F.Su.
- 603. Educational Classics and Contemporary Issues.** (3:3:0) F.
- 606. History of Education in Europe and America.** (4:4:0) Su.
- 607. Education in a World Setting.** (2:2:0) S.  
An examination of the historical, economical, psychological, and political foundations of contemporary, international education.
- 608. Social Foundations of Education.** (3:3:0) F.Su. (m)  
A study of social institutions and the effects they have on the education of young Americans.
- 609. Selection and Utilization of Audiovisual Materials.** (2:2:0) F.Su.  
A survey of available materials, the unique contribution of each to the educational process, and methods of utilizing AV materials to improve instruction.
- 610. Designing and Producing Instructional Materials.** (2:2:1) F.Su. Prerequisites: Ed. 510 and Psych. 460 or consent of instructor.  
Designing and producing instructional media kits or projects.
- 611. Administering Instructional Media.** (2:2:0) Su.  
Designed to familiarize students with the integrated media concept (library, AV, and ETV) and the problems involved in administering a media program in the school and district.
- 612. Supervision of Student Teachers.** (2:2:0) Su.  
For those desiring a well-rounded view of the student-teaching program.
- 622. Advanced Study in Childhood Education.** (2:2:0) Su.  
Educational theory and analysis of current practice in schools as they are related to the significance and problems of early childhood education.
- 623. Science in the Elementary School.** (2:2:0) Su.  
Teaching of modern elementary science, with emphasis on individualized instruction.
- 625. Social Studies in the Elementary School.** (2:2:0) S.Su.  
The scope and sequence of the social studies program, its objectives in developing democratic citizenship, and the methods employed in accomplishing this aim.
- 626. Classroom Procedures in the Elementary School.** (3:3:0) Su.  
For nonelementary education majors.
- 627. Reading in the Curriculum.** (2:2:0) S.Su.  
Reading in the different content areas. Study of comprehension and study skills as developed in kindergarten through grade twelve.

\*Course in area of special education.

- 628. Children's Literature.** (2:2:0) F.Su. Prerequisite: Ed. 340.  
Study of the history, authors, illustrators, and types of children's literature. Exploring and evaluating new books for children. Special attention to reading interests at various age levels.
- 631. Curriculum Development in the Elementary School.** (3:3:0) F.S.Su.  
Principles and procedures for organizing the instructional program; patterns of curriculum organization; and techniques for change, evaluation, and stabilization of curriculum.
- 632. Research and Literature in Reading.** (2:2:0) S.Su. Prerequisites: Ed. 547 and 627.  
Study of the history of reading. Emphasis placed on the research and current literature in the teaching of reading from kindergarten through grade twelve.
- 633. Language Arts in the Elementary School.** (2:2:0) F.Su.  
Best practices in modern methods of instruction in listening, speaking, and writing with their related skills.
- 634. Arithmetic in the Elementary School.** (2:2:0) Su. Clark  
Current trends in elementary school mathematics with emphasis on modern concepts, research, discovery teaching and preparation of materials.
- 636. Secondary Curriculum and Methods: Design.** (3:3:0) F.S.Su.  
The designing of curriculum and units of instruction, with emphasis on effective utilization of instructional staff and technology for individual learning.
- 637. Organization and Supervision of Reading Programs.** (2:2:0) S.  
Study of the reading consultant's role in organizing and supervising reading programs from grades kindergarten through twelve. Practicum experience included. To be taken toward completion of program and with consent of instructor.
- 640. The Junior College.** (3:3:0) F.S.Su.  
The development of the junior college in the United States with emphasis on philosophy, history, purposes, curriculum, and organization.
- 642. Methods of College Instruction.** (3:3:0) F.S.Su.  
Identification of teacher and pupil activities required for conceptual learning at the college level. Appreciation of the college teacher's responsibilities and role as a member of a college staff. Insight into the backgrounds, abilities, interests, and goals of college students and what these mean for instruction. Familiarity with newer tools, teaching materials, and instructional practices.
- 644. Directed Teaching in College.** (2:4:0) F.S.Su.  
Designed to help students to become accomplished and skilled teachers of college classes; to participate effectively as members of a college staff; and to prepare for and complete the steps necessary to be placed into a college or junior college position.
- 645. Guidance Testing and Diagnosis.** (3:3:0) F.S.Su. Prerequisites: Ed. 550, Stat. 552.  
Study of advantages and disadvantages of particular types of tests, practice in interpreting test results, and the implications of test choices and usage.
- 646. Counseling Theory and Practice.** (3:3:0) F.S.Su. Prerequisites: completion of or concurrent registration in Ed. 645; Psych. 450 or 550.  
Includes an intensive study of the various theories of counseling, important concepts and views of counseling authorities, current research, and accepted practices.
- 647. Group Techniques for Counselors.** (3:3:0) S.Su. Prerequisite: Ed. 646.  
Principles of group guidance and their application.
- 648. Laboratory in Counseling Practice.** (1:0:2) F.S.Su. Prerequisite: Ed. 550.  
Laboratory and field experience in counseling techniques and procedures.

650. **Guidance Workshop.** (2:2:0) Prerequisite: Ed. 550.
651. **Informational Services in Guidance.** (3:3:0) F.S.Su. Prerequisite: Ed. 550. Consideration of various aspects of vocation selection including sources of information, use of community resources, counseling procedures, and the filing and use of occupational data. Theories and psychological factors of career selection emphasized.
652. **Administration of Guidance Services.** (2:2:0) S.Su. Prerequisite: Ed. 550. Major consideration given to the procedures of organizing and administering guidance programs, and methods of dealing with the problems related to these activities.
653. **Student Personnel Services in Higher Education.** (2:2:0) S. Prerequisite: Ed. 550.
654. **Problems of the Elementary School Guidance Program.** (2:2:0) S.Su. An intensive consideration of the problems of conducting a guidance program in the elementary school, and the determination of guidance and counseling procedures.
655. **Laboratory in the Administration of Guidance Services.** (1:0:2) F.S.Su. Prerequisite: Ed. 550. Laboratory and field experiences in the organization and administration of guidance services.
656. **Advanced Educational Psychology.** (3:3:1) F.S.Su. Prerequisite: Ed. 403. Human learning and classroom procedures.
- 657.\* **Behavior Problems in the Schools.** (2:2:0) F.S.Su. Prerequisite: Ed. 403. Study of mental hygiene principles and their application to typical classroom problems.
659. **Basic Principles of Instructional Psychology.** (3:3:2) F. Prerequisite: Psych. 460 or equivalent. Basic principles of instructional development and their application to design, development and evaluation of instructional systems.
660. **Research Design and Technical Writing in Education.** (3:3:0) Prerequisite: Stat. 552. A study of research, techniques and designs in the field of education.
661. **Experimental Research in Instructional Psychology** (3:2:4) S. Prerequisite: Stat. 554 or 501 or Psych. 670. Critical review of experimental research in instruction and related areas of psychology. Application of experimental methodology to the design and execution of an experimental study.
- 662.\* **Curriculum Planning for the Mentally Retarded.** (2:2:1) F.S.Su. Advanced study of curriculum and methods; the development of materials and teaching aids for the mentally retarded.
- 663.\* **Curriculum and Methods for the Visually Handicapped.** (2:8 hrs./day for two weeks) Su. Study of curriculum and methods; development of materials and teaching aids for the visually handicapped.
- 664.\* **Workshop: Curriculum and Methods for the Gifted.** (2:8 hrs./day for two weeks) Su. Study of curriculum and methods; development of materials and teaching aids for the gifted.
- 665A,B,C.\* **Diagnosis of Learning Disabilities.** (2:2:8-10 ea.) F.S.Su. Prerequisites: Ed. 570, 572, or consent of instructor. Supervised training in techniques of using evaluative measures for the diagnosis of learning disabilities in the following areas: A—Body Coordination, B—Perception, C—Psycholinguistics.

\*Course in area of special education.

- 666.\* Special Education Services in Public Schools.** (2:2:0) F.Su.  
Problems of organization, administration and supervision of special education services in the public schools.
- 667.\* Diagnosis of Achievement Difficulties.** (3:2:2) F.S.Su. Prerequisite: consent of instructor.  
Survey and use of diagnostic techniques in identification and evaluation of achievement difficulties.
- 668.\* Remedial Teaching Techniques.** (3:2:2) F.S.Su. Prerequisite: Ed. 667 and consent of instructor.  
Remedial procedures applicable to basic subjects with major emphasis in reading.
- 669.\* Guidance and Counseling for the Handicapped.** (2:2:0) S.Su. Prerequisite: Ed. 260.  
Principles and techniques of guidance services for the physically, mentally, or socially handicapped with study of effective counseling techniques. Required for California certification.
- 670. Observation and Participation in Remedial Teaching.** (2:1:4)  
Observation and participation in classes of children with academic handicaps.
- 671. Practicum in Testing and Counseling.** (5:2:10) F.S.Su. Prerequisite: consent of instructor.
- 672. Practicum in School Psychology.** (4:2:8) S.Su. Prerequisite: consent of instructor.  
Analysis of the role and functions of the school psychologist. Supervised experience with school children.
- 673. Practicum in Remedial Teaching.** (2-4:1-2:4-8) F.S.Su. Prerequisites: consent of instructor and Ed. 670.  
Supervised experience in working with academically retarded children; including individualized program planning, remedial teaching and evaluation. A fee of \$15.00 for two semester hours and \$25.00 for four semester hours is charged, payable upon application for practicum.
- 674A,B. Practicum in Learning Disabilities in the Classroom.** (2:2:8-10 ea.) Prerequisites: Ed. 570 and 572, or consent of instructor.  
A—Diagnostic Teaching; B—Prescriptive Teaching.  
Practicum experience in interpreting and utilizing the results obtained from evaluative measures in programming for individual students with learning disabilities.
- 675. Organization and Administration of Public Schools.** (3:3:0) F.S.Su.  
An introduction to the principles, practices, and procedures in modern public school administration. Particular emphasis on the problems and responsibilities of the school administrator.
- 677. Public School Finance.** (2:2:0) F.S.Su.  
Designed with emphasis on theory, principles, and general practices of public school finance. Major emphasis includes understanding the problems of financing education; budgeting; equalization; management of school funds; the role of the local, the state, and the federal government in the financing of public education. (Special attention is given to Utah finance structure and problems.)
- 678. Elementary School Administration.** (3:3:0) F.Su.  
A study of the duties and role of the elementary school principal in providing leadership in the education of children and of problems of elementary school administration. Required for advanced degrees and certification in elementary school administration.

\*Course in area of special education.

- 679. Secondary School Administration.** (3:3:0) S.Su.  
Understanding the leadership role of the principal in organizing and adapting the secondary school program to the educational needs of youth.
- 680R. Internship in Education.** (2-6:0:6-18 ea.) F.S.Su. (m) Prerequisite: consent of instructor eight weeks in advance of registration. Christensen, Moffitt
- 682. The Teacher and School Administration.** (2:2:0) F.S.Su. (m)  
Christensen, Talbot
- 685. Supervision of Education.** (3:3:0) F.S.Su. (m)  
Development of an understanding of the principles of supervision, curriculum, planning and in-service training in the improvement of instruction.
- 687. School Law.** (2:2:0) F.Su.  
Treats the following areas and their relationship and function with education in the U.S.: legal terms as applied to education; origin and functional aspects of the law as they affect public education; parochial schools and public financed educational institutions; legal aspects of state and local district school finance, personnel and pupil administration.
- 690A,B,C,D. Seminar.** (2:2:0 ea.) F.Su. (m)  
A—Administration and Curriculum; B—Special Services; C—Research and Field Services; D—International Education.
- 691R. Doctoral Admission Seminar.** (2:2:0 ea.) F.S.Su. Prerequisite: consent of instructor.
- 693R. Independent Readings.** (1-5:0:3-15 ea.) F.S.Su. (m)
- 696. Independent Research.** (1-4:6-12:0) F.S.Su. (m)
- 698. Field Project.** (2-4:Arr.:Arr.) F.S.Su.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.
- 709. Comprehensive Planning in Education.** (3:2:2) F.S.Su. (m)  
Concepts and techniques of educational planning.
- 712. Media in Instructional Systems.** (3:3:0) Su. Prerequisite: Ed. 609.  
An advanced course in the application of instructional media design and selection principles to the instructional development process.
- 727. Curriculum of the Public Schools.** (2:2:0)  
Study of (1) problems of articulation among all public school levels; (2) the continuity of the curriculum from one level to another; (3) the concerns of curriculum construction.
- 731. Systems Analysis and Design.** (2:2:0) F.Su.  
The systems approach and its application to the analysis and design of educational systems. Includes procedures for introducing new media and methods in education.
- 740. Advanced Counseling Theory.** (2:2:0) F.Su. Prerequisites: Ed. 646; Psych. 550.  
Downing, Kelly  
Advanced work in counseling theory. Includes an intensive study of the various theories and their application to counseling.
- 741. Practicum in Counseling.** (3:1:8) S. Prerequisite: consent of instructor.  
Experience in counseling in a center. Open only to advanced doctoral students.
- 751. Research Design for Doctoral Dissertation.** (2:2:4) Prerequisite: Stat. 552.
- 760. Problems of Elementary School Administration.** (2:2:0) F.S.Su.  
A study of the problems, issues, and areas of difficulty encountered by the elementary school principal.
- 761. Problems in Secondary School Administration.** (2:2:0) F.S.Su.  
This course would identify and select major problems of the modern secondary school principal and be concerned with the systematic and wise solution of major problems which affect the operation of the school.

- 762. The Intermediate School.** (2:2:0) S.Su. (m) Clark, Ovard  
History, purposes, organization, present practices and problems.
- 765. Business Administration of the Public School.** (3:3:0) Su.  
Covers the functions, organization and structure of business administration in public schools. Emphasis on income, budget preparation, auditing and central office business procedures.
- 768. Leadership Functions in Educational Administration.** (3:3:0) F.S.Su.  
A study of developmental leadership theory, group processes, concepts, and strategies essential to successful administrative leadership; with opportunity for some leadership experiences provided.
- 769. School-Community Relations.** (2:2:0) F.S.Su.  
The introduction and development of concepts, principles, and techniques in the organization, initiation, and operation of a planned program of school-public relations.
- 770. Organization and Administration of Continuing Education.** (2:2:0) S.Su.
- 771. Junior College Organization and Administration.** (2:2:0) S.  
A study of the organizational structure and administration of the junior college.
- 773. Public School Building Programs.** (3:3:0) S.Su.  
Principles, problems and practices in the planning, organization and administration of public school building programs.
- 775. Educational Administrative Theory.** (2:2:0) F.S.Su.  
Designed to provide insights into the development of a theory of educational administration in relation to the practical or empirical administrative functions.
- 780R. Internship in Education.** (2:8:0:6-24 ea.) F.S.Su. Prerequisite: consent of instructor eight weeks in advance of registration. Christensen
- 790A,B,C. Seminar.** (2:2:0 ea.) F.Su. Prerequisite: consent of instructor.  
A—Administration and Curriculum; B—Special Services; C—Research and Field Services.
- 791A,B,C. Seminar.** (2:2:0 ea.) S.Su.  
A—Administration and Curriculum; B—Special Services; C—Research and Field Services.
- 798. Dissertation for Ed.D. Degree.** (9) F.S.Su.
- 799. Dissertation for Ph.D. Degree.** (Arr.) F.S.Su.

## ENGINEERING SCIENCES

### Ph.D. Program in Engineering

**Executive Committee:** J. Barton, Cannon (chairman, 223-D FELB), Hanks, Miner.

The Ph.D. program in engineering is an interdepartmental program administered by an executive committee of the engineering faculty. The course work offered in this program is listed separately under each of the four participating engineering departments (chemical, civil, electrical, and mechanical). The faculty consists of the graduate faculty of the four engineering departments.

The master's programs in engineering are administered by each department separately but are coordinated with the Ph.D. program for those who wish to continue beyond the master's level.

### Admission

Admission to the Ph.D. program in engineering is through the Graduate School. Proper forms for application are obtained from and returned to the Office of the Graduate Dean. Initial admission is through the Graduate School. (See General Information, page 34.)

### Doctoral Applicant

Graduate students are classified as doctoral applicants after completion of a qualifying examination or other screening procedure by one of the engineering departments and upon approval of the executive committee and the graduate dean. From this point on, the student's "department" becomes the executive committee.

### Advisory Committee

It is the responsibility of the doctoral applicant to nominate to the chairman of the executive committee a major professor who will serve as his advisory committee chairman and research adviser. After approval by the executive committee and acceptance of the assignment by the advisory chairman, the student and his chairman will suggest an advisory committee consisting of not less than three persons. This advisory committee is then subject to the approval of the executive committee and the dean of the Graduate School.

### General Requirements

The Doctor of Philosophy degree is awarded for significant research attainment in a recognized field of learning, accompanied by completion of an advanced course of study.

The student will select a major field of study, which will generally correspond to the special field or departmental affiliation of his major professor who is his advisory committee chairman and research adviser. In consultation with his advisory committee, the student will propose a course of study which will adequately prepare him for a professional career as an independent scholar in his chosen field. Normally a student should expect to complete approximately fifty semester hours of formal course work beyond the baccalaureate degree, the exact number to be set by his advisory committee based on the student's prior preparation and area of interest. Of these formal course hours, at least eighteen shall be in the minor or supporting area of study, with not less than twelve hours being advanced mathematics unless the advisory committee specifically recommends otherwise.

It is intended that the candidate analyze a significant problem, pursue his investigation to the point where he has made a definite contribution to the body of knowledge in his chosen field, and present the results of his study in a form acceptable to his advisory committee, his major department, and the Graduate School.

The time limits, language, and residence requirements are as listed under "Doctor of Philosophy Degree" in the General Information section of this catalog. All four language options have been approved for use in the engineering Ph.D. program.

### Doctoral Candidate

Upon successfully passing the comprehensive examination, satisfying the language requirement, and submitting a prospectus which has been approved by his advisory committee, the student will be classified as a doctoral candidate. The comprehensive examination is normally taken near the completion of the course work outlined by the doctoral applicant's advisory committee.

### Final Oral Examination

A final oral examination on the candidate's dissertation and applicable subject matter is given by a committee of not fewer than five members of the graduate

faculty. The members of this committee are recommended by the executive committee for appointment by the graduate dean.

### Course Offerings

The course offering in the engineering Ph.D. program is contained in departmental listings that follow this section. It should however, be noted that the program is interdisciplinary in nature and in some areas strength occurs by the crossing of departmental lines.

## Chemical Engineering Science

**Distinguished Professor:** Hall.

**Professors:** Barker, Christensen, Pope, Smoot (chairman, 128 FELB).

**Associate Professors:** Clark, Coates, Glassett, Hanks (graduate coordinator, 234 FELB), Horton.

**Assistant Professor:** Rogers.\*

The Department of Chemical Engineering Science offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy with research in such fields as mass transfer, fluid dynamics, heat transfer, thermodynamics, chemical kinetics, process control, applied mathematics, high-pressure materials, and nuclear engineering.

### Requirements

A student desiring to work toward any graduate degree in chemical engineering should have completed a bachelor's degree or its equivalent from an accredited engineering school. Students without such training are required to complete basic chemical engineering courses before proceeding with a graduate program.

In addition to the general Graduate School entrance requirements, a student may be required to successfully complete a departmental entrance examination before he is accepted as a candidate for the master's degree or as a doctoral applicant.

The student should normally select a research project during the first semester of his residency at the University as a graduate student. This selection is made after he has met and discussed research topics with a minimum of three graduate faculty members.

Students anticipating study toward the Ph.D. degree should refer to the section of this catalog entitled "Engineering Sciences" on page 101, for further details concerning requirements for admission to the doctoral program. Additional information may also be obtained from the graduate program coordinator.

The following information is given as a guide to the student for planning of his program:

#### 1. First-Year Graduate Students\*

All first-year graduate students, regardless of their degree programs, are required to register for the following classes:

Ch.E. 681	(3 hours)
Ch.E. 673	(3 hours)
Ch.E. 677	(1 hour)
Ch.E. 691R	(1 hour)**
Chem. 561	(3 hours)
	<hr/>
	11 hours

\*Students with adequate preparation in any of these areas may be excused therefrom upon demonstrating their competence by special examination.

\*\*A student is required to register for this course in each semester, regardless of the total number of hours accumulated.

## 2. M.S. Candidates

In order to satisfy the University requirements of a minimum of thirty semester hours for the M.S. degree, M.S. candidates will normally complete the following courses in addition to the above eleven hours.

Ch.E. 699	(6 hours)
Ch.E. Options	(5-6 hours)*,†
Minor	(9 hours)†

\*A list of approved optional courses is given following the list of chemical engineering course offerings. Any course from the list will be acceptable toward satisfaction of this requirement. If for valid reasons the student desires to substitute other courses to satisfy this requirement, he may so request by petition through his graduate thesis committee.

†Students electing to minor in nuclear engineering should register for the courses Ch.E. 582 (3:3:0) F., Ch.E. 682 (2:2:0) S., Phys. 557 (1:1:2) S., and Phys. 555 (3:3:0) F. These courses comprise nine of the fourteen to fifteen hours for the option-minor combination. The remaining five to six hours are to be selected from the approved option list below, or as recommended by the adviser.

## 3. Ph.D. Candidates

In order to satisfy the nominal fifty-hour requirement for the Ph.D. degree, the student will normally complete the following courses in addition to the above eleven hours.

Ch.E. Ph.D. Specialty courses	(8-9 hours)*
Ch.E. 791R (2 hours min)**	
Ch.E. 799 (variable as required)	
Minor (including mathematics)	(18 hours)
Ch.E. Options	(10 hours)†

\*Ch.E. 671, 672, 674, 675, and Chem. 769 are the department Ph.D. specialty courses. Questions from all courses will appear on the Ph.D. preliminary examinations and candidates will be asked to answer those in three areas of their choosing. Therefore, the student will normally expect to register for three of the classes of his own choosing. The courses will be offered according to the following schedule:

Year	Fall	Spring
71-72	674	672
72-73	671	675, Chem. 769

This cycle will be repeated in successive years.

\*\*A student must register for Ch.E. 791R each semester he is in residence regardless of the total hours he may accumulate.

†These courses will normally be selected from the approved list below with substitutes being recommended upon the judgment of the student's advisory committee. These courses, together with the minor or supporting field courses, permit the student to specialize heavily in the area of his research interests if he so desires.

### Courses

582. **Introductory Nuclear Engineering.** (3:3:0) F. Prerequisites: Chem. 106 or 112; Math. 214; Physics 221. Barker, Rogers  
Principles and application of nuclear reactor design.
671. **Transport Processes in Reacting Flow Systems.** (3:3:0) F. Prerequisites: Ch.E. 673, 681; Math. 323; Chem. 561 or equivalent. Smoot  
Kinetics and transport in reacting, multicomponent flow, with application to complex systems, free jets, particle-laden streams, plasmas, etc.
672. **Advanced Fluid Mechanics and Rheology.** (3:3:0) S. Prerequisites: Math. 645; Ch.E. 673. Hanks  
An advanced treatment of rheology with emphasis on proper formulation of constitutive equations. Non-Newtonian flow, stability, turbulence, drag reduction, nonisothermal flow and heat transfer.

- 673. Transport Phenomena.** (3:3:0) F. Hanks, Smoot  
General differential equations of conservation of mass, heat and momentum, transport coefficients; turbulent flow, interphase transfer, overall equations of change.
- 674. Advanced Thermodynamics and Calorimetry.** (2:2:0) F. Christensen  
Advanced thermochemistry, experimental apparatus and technique, and application of calorimetry to measure heats of mixing, heat of reaction, equilibrium constant, etc.
- 675. Thermodynamics of Multicomponent Systems.** (3:3:0) S. (Offered 1971 and alternate years) Prerequisite: Chem. 561 or Ch.E. 674.  
Christensen, Clark, Hanks  
Thermodynamic analysis of nonideal multicomponent solutions, use of Gibbs-Duhem equation, prediction of activities and fugacities, thermodynamic consistency of data, development of correlating equations.
- 676. Advanced Diffusional Operations.** (3:3:0) S. Prerequisites: Ch.E. 673; Chem. 561; Math. 323. Clark, Hanks, Smoot  
General theory of differential and stagewise diffusional operations, multicomponent separations, application of computers to complex separations design.
- 677. Creative Skills in Chemical Engineering.** (1:1:0) F. Christensen, Horton, Pope  
Application of creativity and prior course work to the solution of open-end problems currently being encountered in the frontiers of chemical engineering. Introduction of critical path scheduling and operations research.
- 681. Kinetics and Catalysis.** (3:3:0) S. Christensen, Horton, Pope  
Application of fundamental theories of chemical kinetics and transport phenomena to the design of chemical reactors.
- 682. Nuclear Engineering.** (2:2:0) S. Barker  
Reactor design including reactor physics, heat transfer, engineering materials, instrumentation, and control.
- 683. Advanced Plant Design.** (2:2:0) S. Glassett, Pope  
Comprehensive design of chemical plants including feasibility and market surveys, economic evaluations, raw materials, plant layout, process design, instrumentation, materials of construction.
- 684. Advanced Process Dynamics and Control.** (2:2:0) S. Barker  
Dynamics of chemical processes, the measurement of process variables, and the control of processes using feedback control, computer control, optimization, and automation techniques.
- 686. Distillation.** (2:2:0) S. Clark, Pope  
Binary and multicomponent distillation, prediction of equilibrium relationships, extractive and azeotropic distillation, application of computers to complex distillation column design; instrumentation.
- 687. Chemical Engineering Economics.** (2:2:0) S. Christensen, Glassett, Pope  
An investigation of the basic economic principles which govern the operations of chemical industry.
- 688. Special Problems.** (Arr.)  
Investigation of problems of special interest in the field of chemical engineering.
- 691R. Seminar.** (1:1:0 ea.) F.S. (For M.S. students)  
Group discussions of advanced technical subjects related to chemical engineering. Presentations by graduate students, faculty members, and invited guests.
- 697R. Research for Master's Students.** (2-6:0:0 ea.) F.S.Su.

**699. Thesis for Master's Degree. (6-9:Arr.:Arr.) F.S.Su.**

**□Chemistry 769. Selected Topics in Physical Chemistry. (1-3:1-3:0) Hall**  
 This course is offered under the Chemistry Department and is the Chemical Engineering Science Department specialty course in high-pressure phenomena.

**788. Selected Topics in Chemical Engineering. (1-3:Arr.:Arr.)****791R. Seminar for Doctoral Students. (1:1:0 ea.) F.S.****797. Research for Doctoral Students. (Arr.) F.S.Su.****799. Dissertation for Doctoral Students. (Arr.) F.S.Su.****Approved Optional Courses**

The courses in the following list are approved as acceptable for satisfying the chemical engineering optional course requirement. The student may select any combination of these classes to meet his program requirements.

Chem. 562	(2:2:0)	S.	Advanced Chemical Thermodynamics
Chem. 769	(1-3:1-3:0)		Selected Topics in Physical Chemistry
Ch.E. 582	(3:3:0)	F.	
Ch.E. 671	(3:3:0)	F.	Ch.E. 688 (Arr.) Su.
Ch.E. 672	(3:3:0)	S.	M.E. 511 (3:3:0) Intermediate Gas Dynamics
Ch.E. 674	(2:2:0)	F.	
Ch.E. 675	(3:3:0)	S.	M.E. 512 (3:3:0) Boundary Layer Theory
Ch.E. 676	(3:3:0)	S.	
Ch.E. 682	(2:2:0)	S.	M.E. 611 (3:3:0) Theories of Fluid Turbulence
Ch.E. 683	(2:2:0)	S.	
Ch.E. 684	(2:2:0)	S.	M.E. 641 (3:3:0) Heat Transfer Theory I
Ch.E. 686	(2:2:0)	S.	M.E. 642 (3:3:0) Heat Transfer Theory II
Ch.E. 687	(2:2:0)	S.	

Some of the above courses are not offered on a regular basis and the student should be careful to check with the individual departments to determine availability of specific courses.

**Civil Engineering Science**

**Professors:** C. Barton, J. Barton, Enke, Firmage (chairman, 107 FELB), Fuhriman, Jacobson, Rollins, Stutz.

**Associate Professors:** Budge, Christiansen, Karren, Wilkes.

**Assistant Professors:** Durrant (graduate coordinator, 198 FELB), Merritt.

The Department of Civil Engineering Science offers graduate programs leading to the degrees of Master of Science, Master of Engineering, and Doctor of Philosophy in the areas of highway and transportation engineering, water resources engineering including hydraulics and sanitary engineering, soil mechanics and foundation engineering, solid mechanics and materials, and structural mechanics and structural engineering.

A student working toward a graduate degree in civil engineering should have completed a bachelor's degree or its equivalent in civil engineering. Students without such training are required to complete basic civil engineering courses before proceeding with a graduate program. A master's degree may be earned in one additional year of study beyond the bachelor's degree. A student must formally apply for admission to the Graduate School to study for the M.S., M.E. or Ph.D. degrees. Elsewhere in this catalog details on the engineering Ph.D. program may be found. For additional information see the Civil Engineering Science Department chairman.

The M.S. degree, which includes a thesis, normally requires a minimum of thirty credit hours. The graduate student is required to register for graduate seminar, C.E. 691, each semester that he is a full-time student until a maximum of one credit hour is accumulated. This one-half credit hour per semester is not counted as part of the thirty minimum credit hours total.

The Master of Engineering degree is designed for students who plan careers in professional engineering practice, although the program is sufficiently basic to permit the student to continue in further graduate study beyond this degree if desired. Advanced course work in analysis, engineering behavior, and design is supplemented by an engineering study or project so that the student acquires an integrated, professionally oriented experience.

The M.E. program is similar in basic requirements to that of the Master of Science program except for the following: (1) one additional three-credit-hour course, (2) a required engineering study or project of three credit hours. There is no thesis requirement in the M.E. program.

In each of the graduate programs, M.S. or M.E., the student pursues a course of study that is tailored to his particular needs and interests by close consultation with his individual faculty adviser and committee. Further study toward the Ph.D. degree is possible upon graduation with either master's degree.

In addition to the general Graduate School requirements, a student may be required to successfully complete a departmental entrance examination before he is accepted as a candidate for a graduate degree. It should also be pointed out that a written, comprehensive final examination may be required in addition to the oral examination which is required of all students before graduation.

### Courses

- 501. Advanced Mechanics of Materials.** (3:3:0) (Interdepartmental) Prerequisite: C.E. 303.

Introduction to theories of elasticity, plasticity, and strain energy methods; stresses and strains in beams, curved members, rotating discs, thick cylinders, torsion and structural members, elastic and inelastic stability.

- 502. Advanced Properties of Materials.** (3:3:0) (Interdepartmental) Prerequisite: C.E. 305 or equivalent.

Mechanics of deformation and fracture of solids; mechanical behavior of materials correlated with atomic scale mechanisms; creep, residual stresses, and fatigue.

- 503. Elasticity.** (3:3:0) Prerequisites: C.E. 303; Math. 321.

Analysis of stress and strain; equations of equilibrium and compatibility; generalized Hooke's Law; energy theorems.

- 505. Concrete—Its Materials, Uses, and Properties.** (3:2:3) Prerequisite: Geol. 330.

Manufacture and testing of cements; concrete materials and concrete mix design; techniques of concrete handling, placing, and treatment; laboratory work.

- 507. Experimental Stress Analysis I.** (3:2:3) Prerequisite: C.E. 303.

Principles and techniques of the experimental methods of stress determination and their applications to static engineering problems; mechanical and optical gages, brittle lacquers; emphasizes electric strain gages, introduces photoelasticity and photostress techniques.

- 513. Photogrammetry.** (3:2:3) Prerequisite: C.E. 212.

Theory and application of the use of terrestrial and aerial photographs to produce maps; vertical and oblique photography and mapping procedures; stereoscopic viewing and measurements for relative position of objects in three dimensions, photo interpretation, sources of errors.

- 527. Matrix Methods in Structures.** (3:2:3) F.S. Prerequisite: C.E. 422.

Development of stiffness and flexibility matrices for statically determinate and indeterminate structures. Use of the digital computer.

528. **Finite Element Analysis.** (3:3:0) Prerequisite: C.E. 527 or consent of instructor.  
Development of finite elements for a continuum; applications using matrix algebra; consideration of plates, shells, and heat conduction using the digital computer.
531. **Water Resources Engineering.** (3:2:3) Prerequisites: C.E. 431, 432.  
Planning and basic design of hydroelectric flood control, irrigation, and multipurpose projects involving the utilization of water resources; consideration primarily of hydraulic and hydrologic design elements.
543. **Physico-Chemical Characteristics of Soils.** (3:3:0) Prerequisites: Chem. 106, C.E. 341.  
Physico-chemical relationships in soils, including the structures of the clay, minerals, properties of the electrical double layer, ion exchange phenomena, and soil moisture movement and equilibria.
550. **Water Quality Management.** (3:3:0) Prerequisite: consent of instructor.  
Philosophies, objectives, and methods of water quality management; impact of various uses on water quality; behavior of pollutants in receiving waters.
610. **Theory and Design of Plates.** (3:3:0) Prerequisite: C.E. 303.  
Theory and analysis of thin plates and plates of moderate thickness; membrane theory; anisotropic considerations.
612. **Structural Stability.** (3:3:0) Prerequisite: C.E. 303.  
Analysis of beam columns, elastic and inelastic buckling of structural members; torsional buckling and buckling of curved members, thin plates and shells.
615. **Structural Dynamics.** (3:3:0) Prerequisite: C.E. 304 or 527 or equivalent.  
Matrix formulation of the free and forced, damped and undamped, lumped parameter, multiple degree-of-freedom, linear systems. Approximate methods for nonlinear damped systems. Applications to elastic forced response of steel frameworks and beams.
620. **Advanced Structures—Theory and Design.** (3:3:0) Prerequisites: C.E. 423, 424.  
Advanced topics in structural theory and design: arches, frames, continuous structures on elastic supports, plastic design theory.
621. **Thin Shell Structures.** (3:3:0) Prerequisites: C.E. 422, 424.  
Theory and design methods related to domes, arches, solid plate, and hypar structures.
622. **Design of Bridge Structures.** (3:2:3) Prerequisites: C.E. 341, 422, 423, 424.  
Design of bridge structures; floor systems, composite and continuous beams and girders, trusses, piers, and abutments.
623. **Prestressed Concrete.** (3:3:0) Prerequisites: C.E. 422, 424.  
Basic theory of prestressed concrete, pre- and posttensioning methods. Details of design and fabrication, applications to continuous structures.
625. **Design of Multistory Structures.** (3:2:3) Prerequisites: C.E. 341, 422, 423, 424, or consent of instructor.  
Shear walls, floors, columns, frames, and foundations using elastic and plastic methods. Frame response to lateral forces.
632. **Advanced Hydrology.** (3:3:0) Prerequisites: C.E. 431, 432 or equivalent.  
Theory and application of advanced hydrologic principles to engineering design and investigations.
633. **Hydraulic Design of Water Control Structures.** (3:3:0) Prerequisite: C.E. 432.  
Hydraulic and structural design of dams and appurtenant works and other water control structures.

**634. Flow in Open Channels.** (3:3:0) Prerequisite: C.E. 332.

The theory of flows in artificial and natural open channels, and the application of that theory to practical problems.

**641. Advanced Soil Mechanics.** (3:3:0) Prerequisites: C.E. 341, 442 or equivalent.

Advanced topics in soil mechanics including stress distribution in earth masses, the shearing strength of soils, consolidation theory, settlement analysis, stability of slopes, and the bearing capacity of soils.

**642. Advanced Soil Mechanics Laboratory.** (2:0:6) Prerequisites: C.E. 341, 442, 641 or equivalent.

Advanced study in the technique of laboratory investigations of soils.

**643. Earth and Rock-Fill Structures.** (3:3:0) Prerequisite: C.E. 341 or equivalent.

Aspects associated with the design and construction of earth and rock-fill dams including geological study and erection of damsites, location and selection of materials, seepage and pore pressure studies, interpretation of shearing strength data, stability analysis and construction controls.

**644. Advanced Foundation Engineering.** (3:3:0) Prerequisite: C.E. 641.

An applied course in foundation engineering including techniques of subsurface investigation, determination of the allowable soil pressures for footings and the design of spread footings, raft foundation, and pile foundation for structures on clays, silts, and sand.

**646. Flow of Fluids through Porous Media.** (3:3:0) Prerequisites: C.E. 341, 332.

Fluid flow in saturated and unsaturated anisotropic media. Darcy's Law and Navier-Stokes equations. Potential theory and conformal mapping; analogue solutions.

**652. Design of Water Treatment Works.** (3:3:0) Prerequisite: C.E. 655 or consent of instructor.

Theory and practice of water purification and treatment for culinary, municipal and industrial uses.

**653. Design of Municipal Sewage Treatment Works.** (3:3:0) Prerequisites: C.E. 451; Chem. 223; Micro. 381 or consent of instructor.

Theory and practice in the design of sewage disposal and treatment works.

**654. Industrial Waste Treatment.** (3:3:0) Prerequisites: C.E. 653 and 655 or consent of instructor.

Theory and practice in the treatment and disposal of industrial wastes; studies of basic industries and their waste problems.

**655. Sanitary Engineering Analysis.** (2:0:6) Prerequisites: C.E. 451; Micro. 381; Chem. 223; C.E. 550; or consent of instructor.

Analytical techniques involved in chemical and biological analysis of inorganic constituents of water, sewage, and industrial wastes.

**661. Traffic Engineering—Theory of Flow and Geometric Design.** (3:3:0) Prerequisite: C.E. 461 or equivalent.

Analysis of the basic characteristics of motor-vehicle traffic. The theory of traffic flow. Freeway operations and traffic regulations. Design of highways and parking facilities, including freeways and expressways, arterials, at-grade intersections, interchanges, channelizations, parking lots and garages.

**663. Pavement Design.** (3:3:0) Prerequisite: C.E. 461 or equivalent.

Properties and selection of pavement components, including soils, stabilized soil, base, subbase, subgrade, and bituminous materials. Design of rigid and flexible pavements.

**691A,B,C,D. Civil Engineering Seminar.** (1:1:0 ea.)**694. Selected Problems in Civil Engineering.** (1-3:Arr.:Arr.)

- 697R. Research in Civil Engineering.** (2:Arr.:Arr. ea.) Prerequisite: consent of instructor.
- 698. Engineering Projects.** (3:Arr.:Arr.) Prerequisite: registration in MCE program.  
Investigation, study, and presentation of a technical engineering report in an area of civil engineering. The project must be approved by the graduate committee.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)
- 791A,B,C,D. Seminar for Doctoral Students.** (1:1:0 ea.)
- 794. Selected Topics in Civil Engineering.** (1-3:Arr.:Arr.)
- 797R. Research for Doctoral Students.** (Arr. ea.)
- 799. Dissertation for Doctoral Students.** (Arr.)

## **Electrical Engineering Science**

**Professors:** Clegg, Jonsson, Losee (chairman, 175 FELB).

**Associate Professors:** Berrett, Bowman, Chaston, Humpherys, Miner (graduate coordinator, 127 FELB), Monson, Woodbury.

The Department of Electrical Engineering Science offers the degrees of Master of Science and Master of Engineering in the areas of electronics and solid state, communications, computers, electromagnetic fields, network synthesis, power systems, and automatic control. The doctoral degree is available in the areas of electronics and solid state, communications, electromagnetic fields, and computer/automatic control. For further details on the doctoral program, see the section of this catalog entitled "Engineering Sciences: Ph.D. Program in Engineering," or consult the department chairman.

Students working toward a Master of Science degree in electrical engineering are expected to

1. Fulfill the general requirements of the Graduate School.
2. Complete a minimum of fifteen semester hours of acceptable credit in the major and/or minor or supporting fields exclusive of thesis.
3. Take E.E. 513, Linear Systems.
4. Complete a minimum of six hours of acceptable credit in mathematics and/or statistics.
5. Take a minimum of six hours of E.E. 699, wherein the student must do an initial literature study and present his findings at a faculty-student seminar prior to the start of his graduate research.

Students desiring to obtain a Master of Engineering degree in electrical engineering are required to

1. Fulfill the general requirements of the Graduate School.
2. Complete a minimum of eighteen semester hours of acceptable credit in the major and/or minor or supporting fields exclusive of the project.
3. Take E.E. 513, Linear Systems.
4. Complete a minimum of six hours of acceptable credit in mathematics and/or statistics.
5. Complete a one-semester, three-hour project in E.E. 697R, wherein the student submits a project report.

Suggested graduate programs for the Master of Engineering degree are shown below. By substituting E.E. 699 (thesis, six credit hours) in place of E.E. 697R

(project, three credit hours) and a three-credit-hour course, these programs are also recommended for the Master of Science degree.

Computer				Solid State Electronics			
Fall	Spring	Fall	Spring				
E.E. 513	3	E.E. 623	3	E.E. 550	3	E.E. 551	3
E.E. 523	3	E.E. 524	3	E.E. 552R	2	E.E. 552R	1
Math	3	E.E. 697R	3	E.E. 513	3	E.E. 697R	3
Other	6	Math	3	Math	3	Math	3
		Other	3	Other	3	Other	6
—	—	—	—	—	—	—	—
15	15	15	15	14	14	14	16

Power Systems				Communications			
Fall	Spring	Fall	Spring				
E.E. 531	3	E.E. 513	3	E.E. 560	3	E.E. 513	3
E.E. 533	3	E.E. 532	3	E.E. 561	3	E.E. 567	1
Ch.E. 582	3	E.E. 697R	3	E.E. 566	2	E.E. 665	3
Math	3	Math	3	E.E. 664	3	E.E. 697R	3
Other	3	Other	3	Math	3	Math	3
—	—	—	—	—	—	—	—
15	15	15	15	14	14	14	16

Before engaging in research or project work, the student must demonstrate to his faculty adviser the ability to construct and utilize electrical and electronic equipment and devices.

The student will normally be assigned a faculty sponsor and with him determine an advisory committee prior to or at the beginning of his first semester of residence at the University. Either Option I or II is available to the student.

In view of the engineering science emphasis given to the undergraduate curriculum, the transfer student may find it necessary and desirable to take certain courses normally required of the undergraduate student at Brigham Young University. Prospective majors should consult the department prior to registration to determine if such a course will be considered remedial or allowed to apply toward the degree.

#### Courses

- 411. Feedback Concepts.** (2:2:0) S. Prerequisites: C.E. 304; Math. 321; either E.E. 431 and 442, or 302 and 304. Jonsson  
Basic feedback concepts as applied to engineering systems.
- 450. Electrical Properties of Materials.** (2:2:0) S. Prerequisites: E.E. 442; completion of or concurrent registration in E.E. 460. Woodbury  
Electrical properties of crystalline solids.
- 460. Introductory Electromagnetics.** (4:4:0) S. Prerequisite: Math 322.  
Static and dynamic electromagnetic fields; applications to transmission lines, microwave components, and electromagnetic structures.
- 511, 512. Network Synthesis.** (3:3:0 ea.) F.S. Prerequisites: E.E. 312, 442. Humpherys  
Approaches to the design of 2-terminal and 4-terminal networks. Means of meeting insertion loss and phase shift requirements.
- 513. Linear Systems.** (3:3:0) F.S. Prerequisite: graduate standing or consent of instructor.  
State-space and transform techniques in the analysis of linear systems.
- 517. Digital and Sampled-Data Control Systems.** (3:3:0) Arr. Prerequisite: E.E. 411. Jonsson  
Basic theory and techniques for the analysis and design of digital and sampled-data control systems and related problems based on the Z-transform method.

523. **Digital Computer Design.** (3:3:0) F. Prerequisite: E.E. 210.  
The operation and logical design of digital computers.
524. **Switching Theory.** (3:3:0) S. Prerequisite: E.E. 523.  
Analysis and synthesis of combinatorial and sequential switching circuits; their use in computation.
528. **Analog Computer Design.** (3:3:0) S. Prerequisite: E.E. 304 or 442. Jonsson  
Theory and operation of analog computer components; hybrid computation.
531. **Power Systems Analysis I.** (3:3:0) F. Prerequisite: E.E. 431. Chaston  
Polyphase circuits, transmission line constants, power system representation, generalized circuit constants, symmetrical components, fault studies.
532. **Power Systems Analysis II.** (3:3:0) S. Prerequisite: E.E. 531. Chaston  
Characteristics of electric power system components; fault study consideration; introduction to power system stability.
533. **Power Machinery and Equipment.** (3:3:0) S. Prerequisite: E.E. 431. Chaston  
Transformers; synchronous, induction, and DC machines; other power system devices.
537. **Advanced Control Machinery Laboratory.** (1:0:3) S. Prerequisite: E.E. 411. Chaston  
This course constitutes a block of experiments in the area of machinery control systems, machinery characteristics, and power distribution methods.
541. **Switching, Timing, and Pulse Circuits.** (4:3:3) S. Prerequisite: E.E. 442. Clegg, Woodbury  
Passive and active electronic circuits utilizing vacuum tubes, transistors, and other devices with emphasis on nonlinear modes of operation.
542. **Advanced Switching and Pulse Circuits.** (3:3:0) F. Prerequisite: E.E. 541. Clegg  
Theory of switching, shaping, memory and function generation in electronic circuitry. Negative resistance devices and circuits, delay lines, pulse transformers, and logic.
- 550, 551. **Physical Electronics.** (3:3:0 ea.) F.S. Prerequisites: Physics 221 and senior or graduate standing. Recommended: E.E. 450. Bowman, Woodbury  
Theory and applications of solid state electronic devices including Gunn and avalanche diodes, lasers, magnetic and acoustical devices.
- 552R. **Semiconductor Laboratory.** (1-2:0:3-6 ea.) F.S.Su. Prerequisite: completion of or concurrent registration in E.E. 450 or 550. Bowman, Woodbury  
Experimental investigation of semiconductor materials, including basic measurements and construction of electronic devices.
560. **Electromagnetic Engineering.** (3:3:0) F. Prerequisite: E.E. 460. Berrett, Miner  
Application of electromagnetic field theory including microwave and antenna fundamentals.
561. **Communication Circuits.** (3:3:0) F. Prerequisite: E.E. 442, 460; concurrent registration in E.E. 566. Losee, Miner  
Circuits and systems used in radio, television, and radar; microwave hardware and network theory.
564. **Radar Systems.** (3:3:0) S. Prerequisite: E.E. 561. Losee  
Radar systems and their application, including prediction of radar range performance, study of major components constituting a radar, and development of system engineering concepts.
566. **Communications Circuits Laboratory.** (2:0:6) F. Prerequisite: concurrent registration in E.E. 561. Losee, Miner  
Building and testing the circuits studied in E.E. 561.

- 567. Microwave Laboratory.** (1:0:3) S. Prerequisite: E.E. 560. Miner  
Building and testing microwave systems studied in E.E. 560.
- 597R. Special Topics in Electrical Engineering.** (3:3:0 ea.) F.S.Su. Prerequisite: consent of instructor.  
Content varies from year to year. Recent developments in electrical engineering.
- 598R. Special Problems.** (1-2:Arr.:Arr. ea.) Prerequisite: consent of instructor.  
Registration by permission of professor sponsoring problem.
- 617. Optimal Control Theory.** (3:3:0) F. (Offered 1971 and alternate years) Jonsson  
Prerequisites: E.E. 411, 513.  
Performance indices and maximization techniques applied to control systems.
- 618. Nonlinear Analysis.** (3:3:0) F. Prerequisite: E.E. 411. Jonsson  
Consideration of nonlinear differential equations; problems of discrete systems, design in the phase plane, adaptive control systems, dynamic programming.
- 623. Advanced Digital Computers** (3:3:0) S. Prerequisites: E.E. 523; Comput. Sci. 332 or equivalent. Jonsson  
Advanced theory and operation of digital computers and their design and application to engineering, scientific, and control problems.
- 645, 646. Microwave Devices.** (3:3:0 ea.) F.S. Prerequisite: E.E. 560. Berrett, Miner  
Theory and design of passive and active microwave components.
- 661. Advanced Electromagnetic Fields.** (3:3:0) F.S. Prerequisite: E.E. 560. Berrett, Miner  
Physical interpretation of electromagnetic fields. Mathematical methods of solving boundary value and other field problems.
- 663. Antenna Theory.** (3:3:0) S. Prerequisite: E.E. 560. Berrett, Miner  
An advanced viewpoint of radiation, terminal and distributed properties of antenna structures.
- 664, 665. Communication Theory.** (3:3:0 ea.) F.S. Prerequisite: graduate standing or consent of instructor. Humphreys  
Transmission through electric networks, periodic sampling, pulse modulation, analysis of information transmission systems, and noise considerations.
- 697R. Master of Engineering Project.** (3:Arr.:Arr. ea.) F.S.Su.  
One-semester project for Master of Engineering degree.
- 698R. Readings and Seminar.** (1:1:0 ea.) Prerequisite: graduate standing.  
Presentation of literature studies or research results by the graduate student or faculty. Unrelated to the master's thesis or project.
- 699R. Thesis for Master's Degree.** (6-9:Arr.:Arr. ea.) Prerequisite: graduate standing.  
This course is intended to include all work related to the master's thesis; i.e., literature study, research, and writing.
- 791R. Seminar for Doctoral Students.** (1:1:0 ea.)
- 794R. Selected Topics in Electrical Engineering.** (1-3:Arr.:Arr. ea.)
- 797R. Research for Doctoral Students.** (Arr. ea.)
- 799. Dissertation for Doctoral Students.** (Arr.)

## Mechanical Engineering Science

(Including Aeronautical and Astronautical Engineering)

**Professors:** Anderson, Cannon (graduate coordinator, 223-D FELB), Polve, Simonsen (chairman, 223-B FELB), Ulrich.

**Associate Professors:** Free, Heaton, Paxson, Warner, Wille.

The Mechanical Engineering Science Department offers programs in the following areas leading to the master's and Doctor of Philosophy degrees: thermodynamics, heat transfer, gas dynamics, machine design, stress analysis, vibration, automatic controls, and materials and processes.

The objectives of the graduate program in mechanical engineering are to provide an educational opportunity for a superior student to strengthen his undergraduate training and to penetrate deeper into areas of certain and uncertain knowledge. The course offering contains a variety of courses at different levels which allows a student to obtain breadth over several areas or depth in a particular area. The thesis or dissertation provides an opportunity for a student to undertake a project himself and to use his training, initiative, and imagination to explore new and exciting areas.

### Master of Science and Master of Engineering Degrees

To be admitted on a degree-seeking basis, a student must have completed (with the exception of the combined program noted below) a bachelor's degree as well as satisfied the other requirements listed under "General Requirements" in this catalog. Those who have a degree from a school whose curriculum is not accredited by the Engineers Council for Professional Development (ECPD) as a professional engineering curriculum are required to take the Graduate Record Examination (aptitude test and advanced test in engineering).

Undergraduate students may elect to undertake a combined bachelor's and master's program during their last two undergraduate years upon approval of the chairman of the department. In this program a student may take some graduate credit during the last two undergraduate years. This program may allow a student, who qualifies, to complete the bachelor's and master's degrees in a shorter period of time. The B.S., BES, M.E., or M.S. degrees will be granted as the specific requirements are fulfilled.

Upon admission to the Graduate School and before registering for the first semester, a student must have his prior work evaluated by the department. If certain deficiencies are found, the student will be required to take special course work which will not count as credit in the normal degree requirement.

Before taking fifteen hours towards the graduate degree, a student must select a thesis topic and an advisory committee. The purpose of the advisory committee is to help the student plan his course work and to help guide his thesis work. The chairman of the advisory committee is chosen by the student and the chairman of the department, after the student has consulted with at least three graduate faculty members of the Mechanical Engineering Science Department. The other members of the committee are chosen by the student and the committee chairman. It is also the student's responsibility to fulfill all other requirements of the Graduate School as listed in this catalog.

Of the minimum of thirty semester hours of credit required for the master's degree, the Mechanical Engineering Science Department requires for the Master of Science degree, six hours of mathematics and a six- to nine-hour thesis; for the Master of Engineering degree, a three- to five-hour project. (For a BYU undergraduate an integrated Master of Engineering program is outlined in the undergraduate catalog which is entered near the beginning of the third year of study upon application to the Graduate School. A minimum of 2.5 GPA in the previous sixty hours is necessary for entry to the program with a 3.0 minimum GPA necessary in those courses offered for the master's part of the program.) A student may elect either Option I or Option II, as listed in the general section of the catalog, upon approval of the student's advisory committee.

**Doctor of Philosophy Degree**

Requirements for the Doctor of Philosophy degree follow those given in the part of the General Information section of the catalog entitled "Doctor of Philosophy Degree." Further details may be obtained from the chairman of the Mechanical Engineering Science Department.

**Courses\***

- Civil Engineering Science 501. Advanced Mechanics of Materials.** (3:3:0) (Interdepartmental) Prerequisite: C.E. 303.
- Civil Engineering Science 502. Advanced Properties of Materials.** (3:3:0) (Interdepartmental) Prerequisite: C:E. 305 or equivalent.
- 510. Fluid Mechanics II.** (3½:3:2) S. Prerequisites: Math. 322; M.E. 412. Compressible flow; shock effects; Fanno and Rayleigh lines; generalized one-dimensional flow.
- 511. Intermediate Gas Dynamics.** (3:3:0) Prerequisite: M.E. 510 or consent of instructor. Potential theory and Euler's equations. Supersonic and subsonic multidimensional flow. Method of characteristics, small perturbation theory, Hodograph theory. Theoretical airfoil coefficients, etc.
- 512. Boundary Layer Theory.** (3:3:0) Prerequisite: M.E. 412. The stress tensor, Navier-Stokes equations, exact solutions for parallel flow, lubrication theory, Prandtl's equations, separation, Karman-Pohlhausen integral methods; applications.
- 515. Applied Aerodynamics and Flight Mechanics.** (3:3:0) Su. Prerequisite: M.E. 510. An integrated picture of modern applied aerodynamics up to and including performance, stability, and control of aerospace vehicles.
- 521. Advanced Thermodynamics.** (3:3:0) Prerequisite: Math. 322. Extended treatment of the fundamentals of thermodynamics including transient conditions, direct energy conversion, and current topics.
- 522. Combustion.** (3:3:0) Prerequisite: M.E. 322. Mass balance and chemical structure; chemical equilibrium and kinetics as applied to combustion; burning models—solids, liquids, and gases. Deflagration and detonation-type burning, properties of fuels and combustion hardware.
- 523. Statistical Thermodynamics.\*** (2:2:0) Prerequisites: M.E. 321; Stat. 321. Methods of statistical inference, Jaynes formalism, statistical treatment of perfect gases, discussion of thermal properties from a molecular (microscopic) point of view.
- 531. Principles of Automatic Control.** (3:3:0) Prerequisites: Math. 322; M.E. 412, 534. Transfer functions applied to mechanical, hydraulic, pneumatic, and electrical components, and their combination. Block diagrams, Nyquist and Routh criteria, Bode's and root locus plots, integral and error rate compensation. Nonlinear systems.
- 533. Stress Analysis of Aerospace Structures.** (3:3:0) Prerequisite: C.E. 501, or consent of instructor. Particular emphasis is given to analysis of aircraft and missile-type structures; buckling of columns and compression panels; shear and tension field panels; curved beams and rings; and semimonocoque structures.

\*See also related courses in other engineering and physical science offerings.

534. **Dynamic System Analysis and Modeling.** (3½:3:2) F. Prerequisites: Math. 321; C.E. 304.  
Lumped models of mechanical, fluid, electromechanical, and thermal systems. Graphic models, physical system response; analog and digital simulation.
535. **Advanced Vibration Analysis.** (3:3:0) Prerequisite: M.E. 534.  
Vibrations of systems with multiple degrees of freedom; vibrations of elastic bodies; random vibrations; simple nonlinear systems.
537. **Advanced Kinematics.** (3:3:0) Prerequisite: M.E. 431.  
Geometry of constrained motion, with application to point paths; kinematic synthesis; and types of mechanisms.
540. **Heat Transfer.** (3½:3:2) S. Prerequisites: M.E. 412, 321; Math. 323.  
Fundamentals of heat transfer; basic laws, conduction; convection; change of phase; radiation.
541. **Advanced Heat Transfer.** (3:3:0) Prerequisite: M.E. 540.  
Heat transfer analysis by numerical and analog methods. Emphasis on radiation and conduction. Use of digital and analog computers, passive analogs.
552. **Design and Materials Applications.** (3:3:0) Prerequisites: M.E. 351, 454.  
Applied and residual stresses; material selection; static, impact and fatigue strength; fatigue damage; surface treatments; elastic deflection and stability—all applied to mechanical design.
554. **Advanced Manufacturing Processes.** (3:3:0) Prerequisite: M.E. 351.  
Basic analysis of forming, machining, welding, and casting processes with emphasis on microstructures. Selection of process parameters with consideration of economics and material properties.
571. **Systems Design.** (3:2:3) Prerequisites: M.E. 363, 412, 454.  
Philosophy of new product development; entrepreneurship, venture economics, feasibility studies and design practice. Interdisciplinary projects.
572. **Interdisciplinary Systems Design.** (3:1:6) Prerequisite: senior standing in any discipline or M.E. 571.  
Design projects emphasizing group project attack on contemporary problems. Interdisciplinary faculty and student participants.
581. **Internal Combustion Engines.** (3:2:3) Prerequisite: M.E. 322.  
Basic principles of spark-ignition and compression-ignition engines, actual cycles, performance characteristics, carburation and ignition principles, detonation and combustion. Laboratory work with three advanced engine testing cells.
583. **Principles of Turbomachinery.** (3:3:0) Prerequisite: M.E. 412.  
Dimensional analysis; stator and rotor energy and momentum transfer; radial and axial flow machines; system component matching; Reynolds number and Mach number effects; applications.
585. **Jet Propulsion Power Plants.** (3:3:0) Prerequisite: M.E. 510.  
Synthesis course in thermal propulsion systems. The rocket, ram jet and turbojet are used as vehicles for teaching propulsion fundamentals and system interactions.
- 591R. **Seminar.\*** (½:1:0 ea.) F.S. Prerequisite: senior standing.  
Student and faculty presentation of topics of special and current interest.
- 595R. **Special Problems.\*** (Arr. ea.) Prerequisite: consent of department chairman.
- 597R. **Undergraduate Research.\*** (Arr. ea.) Prerequisite: consent of department chairman.

- 611. Theories of Fluid Turbulence.** (3:3:0) Prerequisite: M.E. 412 or consent of instructor.
- 612. Principles of Ideal-Fluid Dynamics.** (3:3:0) Prerequisites: M.E. 412; Math. 322, 323.
- 621, 622. Thermodynamics Theory I, II.** (3:Arr.:Arr. ea.) Prerequisite: M.E. 322.
- 631. Mechanical Control Systems.** (3:3:0) Prerequisite: M.E. 531.
- 635. Advanced Vibration Analysis II.** (3:Arr.:Arr.) Prerequisite: M.E. 535.
- 637. Advanced Dynamics of Mechanical Elements.** (3:3:0) Prerequisites: Math. 322, 323; M.E. 534.
- 641, 642. Heat Transfer Theory I, II.** (3:3:0 ea.) Prerequisite: M.E. 540.
- 661, 662. Elasticity in Engineering.** (3:Arr.:Arr. ea.)
- 697R. Research.\*\*** (Arr. ea.)
- 698. Project for Master of Engineering.** (3-5:0:Arr.) F.S.Su. Prerequisite: fifth year standing in the mechanical engineering program.
- 699R. Thesis for Master's Degree.\*\*** (6-9:Arr.: Arr. ea.)
- 791R. Seminar for Doctoral Students.** (1:1:0 ea.)
- 795. Selected Topics in Mechanical Engineering.** (1-3:Arr.:Arr.)
- 797R. Research for Doctoral Students.** (Arr. ea.)
- 799. Dissertation for Doctoral Students.** (Arr.)

\* Electives offered upon approval of department chairman. Frequency based on demand.

\*\*Graduate courses offered on demand only.

## English

**Professors:** Cheney (emeritus), B. Clark, M. Clark, Craig, Ellsworth, Farnsworth (graduate coordinator, A-242 JKBA), Gassman, Hart, Jacobs, Larson, R. Thomas, Thomson, West (chairman, A-246 JKBA), Wood, Young (emeritus).

**Associate Professors:** Brady, Cox, Evans, Grass, J.B. Harris, Madsen, Mc-Kendrick, Tanner (emeritus), C. Tate, J. Thomas, Waterstradt.

**Assistant Professors:** Arnold, Blanch, Cracroft, Esplin, Hunsaker, Lambert, McKellar, Wight, Williams.

For qualified students seeking the M.A. and Ph.D. degrees in English, attractive scholarships, fellowships, and part-time teaching assistantships are available. Inquiries regarding these should be addressed to the chairman of the English Department.

### Master of Arts Degree

A graduate student may major in either English literature, American literature, or the English language; he may minor in a subject outside the English Department, such as French, linguistics, or comparative literature, or in English literature, American literature, or the English language. He should have reading proficiency in French or German or in another foreign language approved by the department.

Among the thirty hours required for a Master of Arts degree, each student must take the following courses:

	Hours
A. Engl. 615. Bibliography and Methods of Research .....	2
B. Engl. 624. Old English; Engl. 626. Middle English; or Engl. 529. Structure of American English .....	3

The following courses beyond the minimum thirty hours must also be included if the student did not have them as an undergraduate.

A. Engl. 421. The History of the English Language .....	3
B. Engl. 450. Literary Criticism .....	3

In fulfilling the thesis requirement for a master's degree in English, a student may select any one of the following four options:

1. One long thesis on a topic demanding research, criticism, or both.
2. Three long papers written in three different areas of English or American language or literature and on topics demanding research, criticism, or both.
3. Two long papers written in two different areas of English or American language or literature and on topics demanding research, criticism, or both; and a substantial creative work.
4. An extended creative project as described below. A candidate who wants to apply for this option should inform the Graduate Committee of the English Department when he begins his work for the degree. He must comply with the regulations of the English Department and the Graduate School in the same way as other candidates.

The work done under any of the above four options is under the direction of the student's advisory committee and must fulfill all of the requirements of form, date of submission, and binding that apply to a regular master's thesis.

To prepare for option 3 the candidate must complete two hours of the following courses: 315, 316, 318, 319 or, if he is a transfer student, their equivalent; to prepare for option 4 the candidate must complete at least two hours either as a graduate or undergraduate student in the English 300 writing series and at least two hours in English 518R. His average for the required course or courses must be at least "B." He must also submit samples of his current creative writing to the Writing Committee of the English Department, who, within a two-week period, will evaluate them and will recommend acceptance or rejection of the candidate's application. When the candidate for either option has been assigned an advisory committee, the committee will approve his creative project, which may consist of such forms as essays, a drama or dramas, librettos, short stories, a novella, a novel, or poetry, to satisfy the thesis requirement.

#### Doctor of Philosophy Degree

**Admission.** An applicant for a Ph.D. degree in English must have a master's degree in English from an accredited graduate school. If the M.A. or B.A. has not included formal course work in the following areas, it must be completed in addition to the other Ph.D. requirements: (1) History of the English Language (English 421); (2) Old English (English 624), or Middle English (English 626), or the Structure of American English (English 529); (3) Bibliography and Research (English 615); (4) Literary Criticism (English 450 or English 650).

An applicant who is otherwise qualified but is accepted as a provisional student because of some significant deficiency in his preparation (e.g., language training) should expect to supplement his graduate program with whatever additional preparation his graduate sponsor and/or the Graduate Committee of the English Department requires.

**Language Requirements.** (See Option II, page 41.)

**Residence Requirements.** (See page 40.)

**Examinations.** During the first semester a committee of the graduate faculty will survey an applicant's preparation in an oral examination in order to ascertain the areas in which supplementary work may be required.

During the semester in which the student registers for his last course work

(as shown on his program of studies) or later, he may apply to take his comprehensive examination. The comprehensive examination shall consist of a series of four written three-hour examinations, to be taken on two successive days, to be followed in two weeks by an oral examination. For the four written examinations, a student will select in connection with his adviser (1) one period from his major, presumably the period of his emphasis or that within which his interest lies; (2) one period from his minor or one phase of the minor (in such areas as the English language); (3) one genre, which he is expected to investigate comprehensively. For example, a student may wish to focus on the Victorian novel, but he would be expected for the examination to have a thorough understanding of the novel from the beginning up to the present; (4) finally, one major figure. The oral examination, not to exceed two hours, will cover the general major and minor and is intended to assess the candidate's ability to organize his knowledge and to express his ideas orally.

**Dissertation.** The dissertation shall consist of an extended critical and/or scholarly study demonstrating the student's capacity to do research and exercise mature critical judgment.

#### Courses

- 500R. **Eminent American Writers.** (1-3:1-3:0 ea.) F.S.Su.  
Different writers are treated each semester in this series.
- 510R. **Eminent American Writers.** (1-3:1-3:0 ea.) F.S.Su.  
Different writers are treated each semester in this series.
- 518R. **Advanced Creative Writing.** (2:2:0 ea.) F.S. Prerequisite: Engl. 318, 319, or consent of instructor. Larson  
A seminar in the writing of fiction, poetry, drama, and the essay; individual consideration of manuscripts; professional orientation. May be repeated for credit with the permission of the instructor.
- 529. **Structure of American English.** (3:3:0) F.S.Su. Prerequisites: Engl. 321, Ling. 325, or consent of instructor. Cox  
Application of the methods of linguistic science to the description of the phonology, morphology, and syntax of American English.
- 577. **Procedures in Teaching English as a Second Language.** (3:3:3) F.S.Su. 1971. Prerequisite: English 321, 529, or Ling. 423. Madsen  
Designed to acquaint students with methods and materials used in teaching English as a second language. Students will observe, discuss methods, and do some teaching.
- 582. **Extended Readings in Shakespeare.** (3:3:0) S. Farnsworth, Hart, Young  
Extensive study of the body of Shakespeare's works.
- 615. **Bibliography and Methods of Research.** (2:2:0) F.S.Su. Gassman, J. Thomas  
The use of library resources as tools for literary study and an introduction to various areas in which literary research may be pursued. To be taken in the first regular semester of graduate study.
- 621. **Problems in the English Language.** (3:3:0) S. 1973, Su. 1972. Prerequisite: Engl. 421. Cox, McKendrick  
The study of a particular period in the English language or a particular aspect of the language, such as the study of morphology or syntax.
- 624. **Old English.** (3:3:0) F.Su. 1972. McKendrick, Young  
A study of Old English grammar and vocabulary in order to understand traditional syntactical patterns and to read various types of Old English prose and poetry.
- 625. **Beowulf.** (2:2:0) S. 1972. Prerequisite: Engl. 624. McKendrick, Young  
A close reading of the poem in the original, with emphasis upon literary and cultural values.
- 626. **Middle English.** (3:3:0) S. 1972, Su. 1971. McKendrick  
A detailed study of the principal Middle English dialects as illustrated in the literature of the period.

631. **The English Novel.** (3:3:0) S.Su. 1971, F. Prerequisites: Engl. 332, 333, or consent of instructor. Brady, B. Clark, Gassman  
An intensive analysis of literary values and techniques in selected novels. Not a survey course.
635. **The American Novel.** (3:3:0) S.Su. 1972. Blanch, M. Clark, Jacobs  
Various approaches to the novel with emphasis on the formal. Focus may vary according to the instructor and the needs of students.
641. **The English Drama.** (3:3:0) Su. 1971, S. 1972. Craig  
A short intensive survey of English drama from its beginning, followed by independent research.
650. **Literary Criticism.** (3:3:0) F.Su. 1972. Prerequisite: Engl. 450 or equivalent. M. Clark, Hart, Larson  
An examination of modern critical theory and practice and application by students to specific literary works.
- 651R. **Studies in Poetry.** (3:3:0) F. 1971, 1973. Hart, Larson
- 652R. **Studies in Prose Nonfiction.** (3:3:0) S. 1973. Farnsworth, Hart, J. Thomas, Thomson
661. **Colonialism and Puritanism in American Literature.** (3:3:0) F. 1971, 1973. Su. 1974. Prerequisite: Engl. 361 or consent of instructor. Jacobs, Thomson, Williams  
Intensive readings in major writers of the emerging American literary and cultural traditions before 1800.
662. **Romanticism in American Literature.** (3:3:0) F. 1972, Su. 1971, 1973. Prerequisite: Engl. 361 or consent of instructor. Ellsworth, Jacobs, Thomson  
The rise and fruition of the romantic movement in American literature from Freneau to Lowell.
- 663A,B,C,D,E. **Studies in Regional American Literature.** (3:3:0) F. 1972, Su. 1973. Prerequisite: a general background in American literature. Cracroft, Jacobs, Lambert, Thomson
664. **Realism and Naturalism in American Literature.** (3:3:0) Su. 1972, S. 1973. (Once a year, alternate S. and Su.) Prerequisite: Engl. 362 or consent of instructor. M. Clark, Jacobs, Lambert  
Dominant cultural and aesthetic trends since the Civil War.
666. **American Literature, 1900-1950.** (3:3:0) S. 1972, Su. 1973. Prerequisite: Engl. 380 or some other course in modern American literature. M. Clark, Evans, Larson
667. **Folklore.** (2:2:0) S. 1971. Prerequisite: Engl. 391 or consent of instructor. Cheney  
Directed study in folklore and folkways, with emphasis on the Mormon heritage and tradition. Collecting, analyzing, and editing.
669. **Teaching English in the Secondary Schools.** (2:2:0) S. 1971, Su. 1971, 1972. Prerequisite: Engl. 377 or consent of instructor. West  
Intensive consideration of literature, writing, grammar, and reading materials appropriate to English courses, and the effective use of these materials.
671. **The Medieval Period in English Literature.** (2:2:0) S. 1973, Su. 1972. McKendrick  
A close reading in the original of a principal work, such as *Troilus and Criseyde*, *Piers Plowman*, or *Sir Gawain and the Green Knight*, with emphasis upon its relation to the other literature, the culture, and the history of the period.
672. **The Renaissance in English Literature.** (3:3:0) F. 1972, Su. 1973. Prerequisite: Engl. 372 or consent of instructor. Larson, J. Thomas, Wood, Young  
Research in individual authors, styles, influences, and trends. Emphasis will vary according to instructor.

- 673. Classicism in English Literature.** (3:3:0) S. 1972, Su. 1973. Prerequisite: Engl. 373 or consent of instructor. Gassman, Hart  
A study in depth of selected writers from the period 1660-1780.
- 674. Romanticism in English Literature.** (3:3:0) F. 1972, Su. 1973. Prerequisite: Engl. 374 or consent of instructor. Cheney, B. Clark, J. B. Harris  
An intensive review of the major figures and trends in the romantic period (1780-1832), along with individual research.
- 675. The Victorian Age in English Literature.** (3:3:0) S. 1972, Su. 1972, 1973. Prerequisite: Engl. 375 or consent of instructor. Brady, B. Clark, Farnsworth  
A detailed analysis of literary genres, values, and techniques in representative works of the period. Not a survey course.
- 676. British Literature, 1900-1950.** (3:3:0) Su. 1972, S. 1973. Prerequisite: Engl. 380 or some other course in modern British literature. Hart, Larson
- 680. Contemporary Literature.** (3:3:0) Su. 1971, F. 1972. Prerequisite: at least one course in twentieth-century literature, or consent of instructor. M. Clark, Hart, Larson  
Study of specific trends in literature and criticism; students may select areas of interest.
- 682. Problems in Shakespearean Scholarship and Criticism.** (3:3:0) Su. 1970, 1972, S. 1973. (Offered alternately with Engl 641, The English Drama.) Pre-requisite: Engl. 382, 582, or consent of instructor. Farnsworth, Hart
- 695. Individual Readings in English.** (1-2:Arr.:0) F.S.Su.  
Intended for investigation beyond course work offered, not for filling minimum required hours.
- 699. Thesis for Master's Degree.\*** (6-9:Arr.:Arr.) F.S.Su.  
See options described with master's program in English above.
- 728R. Studies in Rhetoric and Style.** (3:3:0 ea.) S. 1973, Su. 1974.
- 729. Advanced Study in English Grammars.** (3:3:0) F. 1973, Su. 1974. Pre-requisite: Engl. 529. Cox
- 755R. Studies in the Tragic Mode.** (3:3:0 ea.) F. 1971, Su. 1972. Craig, Hart
- 756R. Studies in the Comic Mode.** (3:3:0 ea.) S. 1973. Evans, Farnsworth, Gassman, Thomson
- 777. Problems in Teaching English as a Second Language.** (3:3:0)
- 799. Dissertation for the Ph.D. Degree.** (Arr.) F.S.Su. Prerequisite: approval of the candidate's chairman.

\*With reference to continuous registration for this course, see page 34 of this catalog.

## Food Science and Nutrition

**Professors:** Bennion (graduate coordinator, 2218-E SFLC), Page.  
**Assistant Professor:** Johnson (chairman, 2218-B SFLC).

### Requirements

The department offers work leading to the Master of Science degree in food science and nutrition. For full graduate standing a student must have completed a bachelor's degree with a major in food science and nutrition or a closely related field, with basic courses in the physical and biological sciences. Students with subject matter deficiencies may be recommended for admission, but these deficiencies must be removed before a degree is granted.

The specific selection of courses for a graduate degree is based upon the student's objectives and interest and is planned in consultation with the major

professor. The emphasis in the thesis problem may be in the area of food science or in nutrition. However, all candidates for a master's degree in food science and nutrition must have completed the following: FSN 450, 635, 636, 662 690, 691, and 695; Chem. 581 and 584; and a course in statistics. A thesis is required.

#### Courses

- 594. Special Problems in Food Science.** (1-2:0:3-6) F.S. Prerequisite: consent of instructor and department chairman.  
 Designed for students who have completed at least 12 hours in food science and nutrition. Independent study of a special problem in food science under the direction of an instructor.
- 595. Special Problems in Nutrition.** (1-2:0:3-6) F.S. Prerequisite: consent of instructor and department chairman.  
 Designed for students who have completed at least 12 hours in food science and nutrition. Independent study of a special problem in nutrition under the direction of an instructor.
- 635. Advanced Human Nutrition I.** (3:3:0) F. (Offered 1971 and alternate years)  
 Prerequisite: FSN 335 or equivalent.  
 Protein and amino acid nutrition; carbohydrate, lipid, and energy metabolism.
- 636. Advanced Human Nutrition II.** (3:3:0) S. (Offered 1970 and alternate years)  
 Prerequisite: FSN 335 or equivalent.  
 Mineral and vitamin metabolism.
- 662. Flavor and Sensory Analysis of Food.** (2:2:0) S. (Offered 1971 and alternate years)  
 Prerequisite: FSN 450 or equivalent.  
 A study of flavor chemistry and methodology in the sensory evaluation of food.
- 664. Advanced Food Science I.** (2:2:0) F. (Offered 1970 and alternate years)  
 Prerequisite: FSN 450 or equivalent.  
 Protein foods; simple colloidal systems.
- 666. Advanced Food Science II.** (2:2:0) S. (Offered 1971 and alternate years)  
 Prerequisite: FSN 450 or equivalent.  
 Carbohydrates and lipid food materials.
- 690. Seminar in Food Science.** (1-2:1-2:0)
- 691. Seminar in Nutrition.** (1-2:1-2:0) S.
- 695. Methods of Research in Food Science and Nutrition.** (3:0:9) F. (Offered 1970 and alternate years)
- 697R. Research.** (1-3:Arr.:Arr. ea.) F.S.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Geography

**Professor:** Layton (chairman, 167-A HGB).  
**Associate Professors:** Grey, Millett, Tuttle.  
**Assistant Professors:** Hudman, Jackson, Stevens.

#### Requirements

The department offers work leading to the Master of Science degree. The general requirements are those listed by the Graduate School under Option II,

allowing a flexible program of major and supporting courses. Each student must include a core area of Geog. 601, 620, 630, 698, and 699, but is allowed a wide range of work in completing the remainder of his thirty-hour requirement. Consultation with a committee of faculty from both the major and supporting areas provides a program tailored to the specific needs of each candidate.

Persons applying for admission are expected to have a strong background in geography, including a course in map drawing. Those not having an undergraduate geography major should consult with the departmental faculty concerning remedial work which might be required. The amount of such remedial work and whether it may be accomplished through individual study or through formal classwork are determined on an individual basis. Students may be required to submit samples of written work or to take a diagnostic examination prior to formulating their graduate program. Students not having undergraduate training at Brigham Young University are encouraged to submit scores from the geography section of the Graduate Record Examination.

#### Courses

- 501. Geography for Teachers.** (3:3:0) S. Layton, Stevens  
A systematic approach to the fundamentals of geography emphasizing source materials, teaching methods, tools, and techniques.
- 504. Geographic Field Techniques.** (2:1:2) F.S.  
For majors only.
- 520. Quantitative Methods in Geography.** (3:3:0) S. Prerequisite: Math. 105 or equivalent.  
Application of quantitative methods in geography.
- 522. Urban Geography.** (3:3:0) F. (G-SS m) Layton  
Distribution of urban areas, their development, internal land use patterns, and functions in the world's economy.
- 533. Industrial Geography.** (3:3:0) S. (G-SS m) Prerequisite: Geog. 231. Stevens  
A systematic analysis of major industries in the United States with emphasis on planning and industrial location theory.
- 553. Geography of Utah.** (2:2:0) S. (G-SS m)  
A study of the state's cultural and physical characteristics, their distribution and significant interrelationships.
- 556. South America.** (2:2:0) S. Prerequisite: Geog. 455 Layton
- 557. Caribbean Area.** (2:2:0) Prerequisite: Geog. 455. Layton
- 561. Western Europe and the Mediterranean.** (2:2:0) Prerequisite: Geog. 460. Stevens  
A comprehensive study of the systematic and regional geography of non-Communist Europe.
- 571. Problems of Asia.** (2:2:0) F. Prerequisite: Geog. 470. Horiuchi  
A comprehensive study of the systematic and regional geography of Asia.
- 580. Geography of Underdeveloped Areas.** (2:2:0) F. (G-SS m) Prerequisite: consent of instructor. Horiuchi  
Physical, economic, and human geography as it affects the world's underdeveloped areas, with emphasis on future development possibilities.
- 598. Seminar in Techniques of Research and Presentation.** (2:2:0) Grey  
A proseminar in scholarly use of geographical sources, leading to a substantial paper in oral and written form.
- 601. Physical Geography.** (2:1:2) F. Stevens
- 620. Cultural Geography.** (2:1:2) S.

**630. History and Philosophy of Geography. (2:2:0)**

The development of geographical thought. Major concepts concerning the nature, scope, and methodology of the discipline.

**690R. Readings. (1:0:2 ea.) F.S.****695. Special Problems. (1-2:1-2:0) F.S.****698. Seminar in Systematic Geography. (2:2:0)**

A detailed investigation into selected aspects of systematic geography.

**699. Thesis for Master's Degree. (6-9:Arr.:Arr.) F.S.**

## **Geology**

**Professors:** Bissell, Bullock, Bushman, Hamblin, Hansen, Hintze (graduate coordinator, 362 ESC), Phillips, Rigby (chairman, 274 ESC).

**Associate Professors:** Best, Braithwaite, Brimhall, Petersen.

**Assistant Professor:** Baer.

### **Fields**

paleontology;  
economic geology;  
mineralogy, geochemistry, and petrology;  
stratigraphy and sedimentation;  
structural and field geology

### **Requirements**

The following courses, or their equivalents from another university, are prerequisite for all geology students working toward an advanced degree in geology: Geol. 111, 112, 301, 310, 311, 312, 313, 351, 352, 460, 470, and 480. A summer field camp, Geol. 410, or its equivalent at another institution, is a necessary prerequisite.

The entering graduate student will be expected to have completed substantially the same background course requirements in mathematics, chemistry, physics, biology, and languages, as are required of Brigham Young University undergraduate geology majors. Arrangements to make up any undergraduate deficiencies will be made in consultation with the Geology Department chairman during the first registration of students entering on their graduate work.

The Department of Geology offers training for the master's degree and the degree of Doctor of Philosophy, with specialization in various fields of geology. The graduate student is urged to acquire a broad undergraduate foundation in geology and supporting fields before he concentrates on a chosen branch of the subject. To this end certain fundamental course work is required as listed above. Graduate course offerings in geologic specialties are varied so that all students may select courses according to their needs and inclinations as determined in consultation with their advisers.

It is expected that graduate students will meet all the general requirements for advanced degrees as outlined by the Graduate School. The responsibility of meeting these requirements rests with the student.

The graduate program of the Department of Geology offers instruction in five broad divisions of geology, with the following course offerings in each division: (1) paleontology—Geol. 507, 510, 512, 540, 551, 574, 575, 576, 577, 580, 581, 582, 583, 680, 682, and 685; Botany 539 and 678; (2) stratigraphy and sedimentation—Geol. 507, 510, 511, 512, 540, 574, 575, 576, 577, 583, 670, 672, and 678; (3) economic geology—Geol. 507, 510, 512, 520, 530, 535, 540, 545, 546, 551, 552, 561, 562, and 563; (4) mineralogy, geochemistry, and petrology—Geol. 507, 510, 512, 540, 545, 546, 551, 552, 561, 562, 655, 656, 671, and 672; Physics 581 and 582; (5) structural and field geology—Geol. 507, 510, 511, 512, 515, 530, 540, 551, 610, 670, 671, 672, and 678.

A student may select any one of the five fields for a major. He may elect one or two of the remaining fields for his minor(s). Geol. 512 is required of all graduate students. Geol. 696, 698, 699, and 799 are variable credit courses commensurate with work completed in each of these areas.

### Master's Degree

(For general requirements see Graduate School regulations.) Requirements for a Master of Science degree in geology include: (1) at least fifteen hours of formal course work in the major field and at least nine hours of formal course work in a minor field; (2) a written exploratory examination at the beginning of the graduate program at the discretion of the geology faculty; (3) a comprehensive oral examination on the graduate course work prior to the student's thesis defense; (4) a thesis embodying the results of research under a faculty member's supervision for a total of six credit hours; and (5) a final oral examination on the research thesis.

### Doctor of Philosophy Degree

(For general requirements see Graduate School regulations.) Requirements for a Doctor of Philosophy degree in geology include (1) a written exploratory examination covering undergraduate and previous graduate studies, given at the beginning of the Ph.D. program and at the discretion of the geology faculty; (2) completion of formal course work, as outlined by the student's graduate advisory committee in one of the five major areas listed above, and completion of a minor field (the minor may be in a related field outside the Department of Geology in which upper-division and graduate courses will be acceptable; (3) successful completion of Graduate School foreign language examination; (4) a comprehensive examination after sixty hours of graduate work and at least one academic year prior to graduation; (5) dissertation embodying the results of original research; and (6) oral defense of the student's dissertation before a formally appointed committee at the close of his final year of study.

### Courses

501. **Rocks and Minerals.** (2:2:0) F.Su. (m) Bullock  
Study of fundamentals of rock and mineral classification and identification. Designed to acquaint students with earth's common raw materials, occurrences, and uses. For nongeology majors.
502. **Geology for Teachers.** (2:2:0) S.Su. (m) Prerequisites: Geol. 101 and 102, or 103, or 111. Bushman  
Designed to aid junior and senior high school teachers of earth science or geology. Emphasis on materials and methods useful for the classroom.
507. **History of Geology.** (2:2:0) F. (Offered 1970-71 and alternate years) Bushman  
Historical development of geology and the men who contributed to it. Concepts and philosophy distinctive to geology.
510. **Conducted Field Trips.** (1-3:Arr.:Arr.) S.Su. Prerequisite: Geol. 101, 103, or 111.  
Visits to and explanations of a variety of geologic features spectacularly displayed in the Intermountain West. Credit varies with number and length of trips in which student participates, but in general 30 hours will be spent in the field for each credit hour. Maximum credit allowable is 3 hours.
512. **Geology of North America.** (4:3:2) S. Rigby  
A region-by-region study of the areal geology, physiography, and geologic development of Canada, United States, and Mexico.
- Chemistry 514. Inorganic Chemistry.** (3:3:0)
515. **Photo Geology.** (3:1:4) S. Prerequisite: Geol. 311. Hintze  
Photo geologic techniques used by field geologists using instruments adapted to contact print air photos.

- 520. Petroleum Geology.** (4:4:0) S. (Offered 1971-72 and alternate years) Hansen  
 Origin, classification, physical properties, distribution, accumulation, and methods of exploration of petroleum.
- 535. Ground Water.** (4:4:0) F. (Offered 1970-71 and alternate years) Hansen  
 Origin, classification, migration, distribution, and production of water found beneath the earth's surface.
- Botany 539. Paleobotany.** (3:2:3) S. Tidwell
- 540. Geophysics and Constitution of the Earth.** (2:2:0) F. (Offered 1971-72 and alternate years) Best  
 Introduction to seismic, gravitational, magnetic, and thermal behaviors of the earth, emphasizing application of these to interpretation of mantle and crustal phenomena.
- 544. Geochemistry Laboratory.** (2:1:2) F. Prerequisite: consent of instructor. Brimhall  
 The use of modern spectroscopic instruments for the acquisition of chemical and isotopic data on geological materials.
- 545. Geochemistry.** (3:3:0) S. (Offered 1970-71 and alternate years) Prerequisite: consent of instructor. Brimhall  
 Investigation of geological materials and processes from a chemical point of view.
- 546. Isotope Geology.** (2:2:0) S. (Offered 1971-72 and alternate years) Prerequisite: consent of instructor. Brimhall  
 Geochronology and stable isotope geochemistry.
- 551. Advanced Mineralogy.** (3:2:2) S. Prerequisite: Geol. 451. Phillips  
 Crystallography, structure and crystal chemistry of major mineral groups studied by X-ray diffraction and other methods.
- 552. Igneous and Metamorphic Petrography.** (3:1:4) S. Prerequisite: Geol. 551. Best  
 Systematic petrography of rocks in thin section; determination of mineral compositions and associations.
- 561. Ore Deposits.** (4:4:0) F. Prerequisite: Geol. 460. Bullock  
 Metallic ore deposits, their origin, classification, and distribution. Major ore deposits of the United States will be studied.
- 562. Industrial Minerals and Rocks.** (3:3:0) S. (Offered 1970-71 and alternate years) Prerequisite: Geol. 460. Bullock  
 Study of industrial minerals and rocks, their mode of occurrence, distribution, and application in the modern world.
- 563. Mining Geology.** (3:3:0) S. (Offered 1971-72 and alternate years) Prerequisite: Geol. 460. Bullock  
 Principles of ore search and appraisal, assembling geological data, mining techniques, and ore treatment.
- 574. Principles of Stratigraphy.** (3:2:2) F. (Offered 1970-71 and alternate years) Prerequisite: Geol. 470. Bissell  
 Study and interpretation of stratified rocks, principles of their origin, distribution, and correlation.
- 575. Precambrian and Paleozoic Stratigraphy.** (3:3:0) F. (Offered 1970-71 and alternate years) Hintze  
 Synthesis of regional stratigraphic relations in North America.
- 576. Mesozoic and Cenozoic Stratigraphy.** (3:3:0) S. (Offered 1970-71 and alternate years) Hamblin  
 The basins of deposition (throughout the U.S.) of Mesozoic and Cenozoic rocks and key fossils associated with them.

- 577. Oceanography.** (3:3:0) F. (Offered on demand) Prerequisite: Geol. 470.  
Hamblin  
Study of physical processes operating within oceans, and resulting shore-line topography, sedimentary patterns, and sea floor features.
- 580. Invertebrate Paleontology (Protozoans through Brachiopods).** (4:3:2) F.  
(Offered 1971-72 and alternate years) Rigby  
Morphology, paleoecology, evolution, and stratigraphic significance of invertebrates. Basic course for students planning to do graduate work in paleontology or stratigraphy.
- 581. Invertebrate Paleontology (Mollusks through Hemichordates).** (4:3:2) S.  
(Offered 1971-72 and alternate years) Petersen  
Continuation of Geol. 580.
- Physics 581. Introduction to X-Ray Diffraction Analysis.** (3:2:3) F. Barnett
- Physics 582. X-Ray Crystallography.** (3:2:3) S. Barnett
- 582. Biostratigraphy.** (3:2:2) F. (Offered 1971-72 and alternate years) Pre-requisite: Geol. 480 or 581. Braithwaite  
Fossils in their stratigraphic setting and principles of paleontologic chronology.
- 583. Palynology.** (3:2:3) F. (Offered 1970-71 and alternate years) Prerequisites: Bot. 105; Geol. 480. Bushman  
Study of modern and fossil palynomorphs, techniques used in preparation and identification, and application to stratigraphic and paleoecologic problems.
- 591R. Seminar.** (1:1:0 ea.) F.S.  
Required of all graduate students; and required attendance of all seniors.
- 610. Structural Geology.** (3:3:0) S. (Offered 1971-72 and alternate years) Baer  
Earth structures and their origin, emphasizing sequence of tectonic events and their global significance.
- 655. Igneous Petrology.** (5:4:3) (Offered on demand) Prerequisite: Geol. 551. Best  
Origin and crystallization behavior of magmas, with emphasis on crystal-liquid relations in simple experimental systems.
- 656. Metamorphic Petrology.** (3:2:3) (Offered on demand) Prerequisite: Geol. 655. Best  
Subsolidus mineral equilibria; thermodynamic concepts; geologic variables in metamorphic systems; graphical analysis of mineral assemblages.
- 670. Sedimentation and Sedimentary Tectonics.** (3:2:2) S. (Offered 1970-71 and alternate years) Bissell  
Fundamental concepts in the science of sedimentology, and tectonic environments which control sedimentation.
- 671. Sedimentary Petrology—Carbonate Rocks.** (3:3:2) F. (Offered 1971-72 and alternate years) Bissell  
Field and laboratory classifications and studies of carbonate sedimentary rocks.
- 672. Sedimentary Petrology—Clastic Rocks.** (3:2:2) S. (Offered 1971-72 and alternate years) Prerequisite: Geol. 470. Hamblin  
Field and laboratory study and classification of clastic rocks, particularly sandstones and shales.
- Botany 678. Organic Evolution.** (3:3:0) S. Stutz
- 678. Subsurface Methods.** (3:2:2) F. (Offered on demand) Prerequisite: Geol. 551. Baer  
Subsurface methods and techniques as they apply to practical subsurface exploration.

680. **Micropaleontology.** (3:2:2) S. (Offered 1970-71 and alternate years) Prerequisite: Geol. 480 or 581. Braithwaite  
Systematic study of geologically important microfossils, including techniques, morphology, and stratigraphic significance. Conodonts, ostracodes, and foraminifera are stressed.

682. **Vertebrate Paleontology.** (3:3:0) F. (Offered on demand) Prerequisite: Geol. 480 or 581, or consent of instructor.  
The backboned animals through time (Agnatha through Mammalia). Morphology, ecology, phylogeny, and stratigraphic significance are stressed.

685. **Paleoecology.** (4:3:2) S. (Offered 1971-72 and alternate years) Prerequisite: Geol. 480 or 581. Rigby  
Interpretation of ancient environments, and a systematic treatment of major taxonomic groups from the professional literature.

696. **Reading and Conference in Geology.** (1-4:1-4:0) F.S.Su.

697R. **Directed Field Studies.** (1-6:Arr.:Arr. ea.) F.S.Su.  
Supervised field work in any of the fields of specialization in geology for candidates for master's degree.

698. **Research.** (1-4:1-4:0) F.S.Su.

699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. (m)

797R. **Directed Field Studies.** (1-6:Arr.:Arr. ea.) F.S.Su.  
Supervised field work in any of the fields of specialization in geology for candidates for Ph.D. degree.

799. **Dissertation for Doctor of Philosophy Degree.** (Arr.) F.S.Su.

Health Sciences

**Professors:** Hartvigsen, Shaw (college coordinator, 221-F RB), Watters (chairman, 213 RB).

**Assistant Professors:** Hafen, Heiner, Overstreet, Thygerson.

## Requirements

An undergraduate major or minor or equivalent in health sciences and acceptance by the department graduate faculty are necessary for admission. A qualifying written or oral examination may be given to each student before final acceptance.

The recommended graduate program is established after consultation with the sponsor and chairman of the graduate committee assigned by the department chairman with the approval of the college graduate coordinator.

## **Master of Science Degree**

The Master of Science degree (M.S.) in health science will be awarded upon the completion of a minimum of twenty-four hours of prescribed course work, an approved thesis, and satisfactory performance in a written and oral examination. Two options are acceptable:

**Option I.** Major combined with a minor:

Course work required in major	15 hrs.
Course work required in minor	9 hrs.
Thesis	6 hrs.

Total 30 hrs.

<b>Option II.</b> Major combined with related or supporting areas:	
Course work required in major	15 hrs.
Course work required in major or related area	9 hrs.
Thesis	6 hrs.
	Total
	30 hrs.

### Master of Health Education Degree

The Master of Health Education degree (M.H.Ed.) will be awarded upon the completion of a minimum of thirty-two hours of prescribed course work and satisfactory performance in a final written and oral examination. Two options are allowed (no thesis required):

<b>Option I.</b> Major combined with minor:	
Course work required in major	20 hrs.
Course work required in minor	9 hrs.
Elective courses	3 hrs.
	Total
	32 hrs.
<b>Option II.</b> Major combined with related or supporting areas:	
Course work required in major	20 hrs.
Course work required in major or related areas	12 hrs.
	Total
	32 hrs.

1. A course in statistical methods, two semester hours or its equivalent, is required.
2. The course, Research Methods in Health Sciences, or its equivalent, will be required for the first or second term of residence.
3. The candidate may also be required to work with the Utah County Public Health Department on a special practical problem of community health.

For additional information regarding the master's degree in health science, write to the department chairman, 213 RB.

### Courses

- Microbiology 311. Sanitation and Public Health.** (2:2:0)
- Psychology 321. Psychology of Adolescence.** (3:3:0)
- Microbiology 331. Microbiology.** (5:3:6)
- Physical Education 344. Physiology of Activity.** (3:3:0)
- Sociology 357. (Sociol.-Psych.) Group Relations and Leadership.** (3:3:0)
- Sociology 360. Introduction to the Field of Social Work.** (3:3:0)
- Botany 376. General Genetics.** (3:3:0) Prerequisites: introductory course in college biology and one-year course in college chemistry.
- Zoology 376. General Genetics.** (3:3:0)
- Sociology 389. Social Aspects of Mental Health.** (3:3:0)
- Zoology 417. General Parasitology.** (4:3:3)
- Zoology 535. Medical Entomology.** (2:1:2)
- Psychology 440. Abnormal Psychology.** (3:3:2)
- Zoology 465. Mammalian Physiology.** (4:3:3)

- 501. Health Education Workshop.** (1-3:Arr.:Arr.) F.Su. Watters  
 Intended primarily for extension credit and/or summer school. Involves a presentation of health education problems followed by discussions. Conducted on a workshop basis.
- Microbiology 501. Pathogenic Microbiology.** (5:3:6) Prerequisite: Micro. 331 or consent of instructor.
- 502. Driver and Safety Education Workshop.** (1-3:30:18) F.Su. Prerequisite: certified driver education instructor or consent of department chairman.  
 Presentation of current state and national driver and safety education problems, research, and methods of instruction.
- 503. Health Problems Workshop.** (1-3:Arr.:0) F.Su.  
 Current problems related to school and community health.
- 530. First-Aid Instructorship.** (2:2:1) F.Su. (m) Watters  
 Designed to qualify instructors in Red Cross first aid, so that they may conduct classes to qualify individuals for standard and advanced Red Cross cards.
- Microbiology 531. Virology.** (4:2:6) Prerequisite: Micro. 501 or 511.
- Education 550. Introduction to Guidance Services.** (2:2:0)
- 551. Field Work in Community Health.** (2:Arr.:Arr.) Recommended: Health 451. Overstreet  
 Designed to broaden the understanding of community health agencies, their roles, programs, and relationships. Accomplished by field introductions to the various official and voluntary health agencies followed by the selection of agencies in which to do field work during the semester.
- Statistics 552. Statistical Methods in Education I.** (3:3:0)
- 552. School Health, Organization and Services.** (2:2:0) S. (m) Shaw  
 Considers desirable school health services and functions and relationships to public education and education law. Coordinates school health services with community programs.
- 561. Health of the Body Systems.** (3:3:0) S. (m)
- Geography 580. Geography of Underdeveloped Areas.** (2:2:0)
- Psychology 585. Advanced Physiological Psychology.** (3:3:0)
- 625. Problems and Research Review in Safety Education.** (2:2:0) Prerequisite: Health 325. Thygerson  
 Analysis of accident cause and prevention; problems of behavior in school, home, traffic, and public; examination of theories and statistics.
- Physical Education 631. Problems in Athletic Conditioning.** (2:2:0)
- Education 646. Counseling Theory and Practice.** (3:3:0)
- 650. Preservation of Human Health.** (3:3:0) Prerequisite: Health 451 or equivalent. Hafen  
 An epidemiological approach to the cause, nature, extent, and trends in the deterioration of human health.
- 651. Community Organization for Health.** (3:3:0)  
 Nature of voluntary health organizations, current research in community school organization, and relationship of school health programs to community.
- 660. Body Responses to Health and Disease.** (2:2:0) Prerequisite: Health 561 or equivalent. Rhodes  
 The physiological responses to stimulants in the human systems.
- Physical Education 662. Administration and Public Relations.** (3:3:0) F.

**□Zoology 662. Advanced Physiology I. (2:1:2)****670. Environmental Health. (2:2:0)**

Emphasis upon educational practices that relate to improving the environmental approach to health education.

Burgener

**671. Graduate Practicum. (1:1:0)**

Watters

Analysis of the role and functions of the college health teacher. Supervised experience in teaching and research.

**672. Social Hygiene. (2:2:0)**

Heiner

To prepare a prospective teacher to instruct in family life education as it relates to health. Emphasis on the area of sexual maturation, family health problems, parenthood, and other social hygiene factors.

**692. Research Methods in Health Sciences. (3:3:0)**

Shaw

**□Physical Education 692. Research Methods in Physical Education. (2:2:0)****693. Research in Health Science. (2:1:2) F.S.Su.**

Independent and/or directed research in problems associated with the health sciences. Gives credit to graduate students involved in directed or independent research from grant-in-aid, fellowship, or contract grant support.

**694. Seminar in Readings. (2:2:0) S.Su.**

Watters

**696. Seminar in Problems. (1:1:0) F.Su.**

Watters

**698. Field Project. (1-4:Arr.:Arr.) S.Su.****699. Thesis for Master's Degree. (6-9:Arr.:Arr.) F.S.Su.**

## History

**Professors:** Addy, Campbell, Hafen, Hyer, Jensen (chairman, 250 MSRB), Swensen.

**Associate Professors:** Alexander, Allen, Cardon, Larson, Marlow, Schmutz (graduate coordinator, 243 MSRB), Warner (assistant chairman, 210-B MSRB).

**Assistant Professors:** Britsch, Hill, Tobler, Wood.

The Department of History offers work leading to the Master of Arts and Doctor of Philosophy degrees.

### Matriculation

A student undertaking work toward a graduate degree in history must either have an undergraduate degree in history or obtain permission from the department chairman and complete, outside of his graduate program, any courses required in the undergraduate history program. In addition to submitting the formal application for admittance to the Graduate School, the applicant must take the Graduate Record Examination and have the results of both the aptitude and advanced tests forwarded to the History Department. The results of these tests must be received before the application for admittance can be evaluated.

Upon entering his graduate program in history, the student should consult with his departmental sponsor (the name of the sponsor will be indicated on the acceptance form) who will counsel him until his advisory committee is formed and will guide him in the formation of the committee.

### Master of Arts

A candidate for the Master of Arts degree in history should tailor his program to suit his postgraduate aims. If he plans to teach junior high or high school, he should keep in mind the emphasis in these schools on U.S. and world history.

Junior colleges, on the other hand, offer qualified faculty members opportunity to teach more advanced courses in U.S., European, Asian, Latin-American, Russian, and other fields of history. If, however, the M.A. is being sought for other purposes or as a steppingstone to the Ph.D., it should be planned to suit such goals.

**Course Requirements.** A minimum of thirty semester hours of graduate credit is required for the M.A. Under **Option I** of the program, at least fifteen hours—exclusive of the thesis—must be in history and at least nine hours in an outside field approved by the advisory committee chairman. Under **Option II**, all thirty hours are taken in history or in fields in direct support of the student's program.

The course work in history must include a graduate seminar, usually taken in the student's thesis field. This seminar may provide an opportunity to do preliminary work on the thesis.

It lies within the option of the advisory committee to require additional reading, aside from course work, either to provide greater depth in particular areas or to fill in gaps in the student's M.A. program.

**Master's Thesis.** The thesis topic should be selected as early as is feasible. A thesis prospectus—signed by the advisory committee and the department chairman—must be filed with the Office of the Graduate School dean prior to the last semester in which the student will take credit applicable toward the degree.

The thesis must show a critical knowledge of the primary and secondary sources and make a useful, original contribution to historical scholarship. It must be written in correct, concise English at a length relative to the demands of adequate topic coverage. A departmentally approved style manual should be consulted in thesis preparation.

**Final Examination (two-hour oral).** The first part of the final examination (one and one-half hours) probes the student's understanding of the subject matter. He is expected to know the general factual content and basic interpretations of U.S. and world history, at least at the level of History 110, 111, 170, and 270 or their equivalents, and he must demonstrate ability to probe deeply into the facts and discuss interpretation pertinent to the graduate courses he has taken.

The second part of the final examination (one-half hour) is on the thesis. In this examination the student must show a thorough understanding of the primary and secondary sources which are pertinent to the thesis subject. He must also explain how his thesis contributes to historical scholarship.

#### Doctor of Philosophy Degree

To enter the Ph.D. program in history, a student must have a master's degree or one year of graduate study in history and the consent of the department chairman.

**Residence Requirements and Course Work.** Under normal conditions the Ph.D. requires three years of full-time work beyond the M.A. The Ph.D. program emphasizes independent study and research above course work. The caliber of work done in independent study and research is a principal criterion for judging the ability and potential of the doctoral candidate. One year of study (at least eighteen credit hours taken in two consecutive semesters and including a Ph.D. seminar) must be taken in residence. This requirement is exclusive of dissertation credit and should be met with courses selected from the 600- and 700-level in the catalog.

In fulfilling field requirements, the student will be expected to achieve a level of competency in a general field (hereafter referred to as the major field) selected from Group I, below. He will also achieve a special competency in an area of specialization within the major field (see Group II). In addition, he will present a second general field (Group I) or a second area of specialization (Group II) selected from a general field other than his major field. This second field or area will be considered the minor field. These three fields—the major field, the area of specialization within the major field, and the minor field—constitute the history fields. In addition to these, the student will present an approved field outside history.

**Group I. General Fields.**

- A. American History
- B. Ancient History
- C. Medieval History
- D. Modern Europe
- E. History of Asia
- F. Latin-American History

**Group II. Areas of Specialization\***

- A. American History
  - 1. Colonial History, to 1789
  - 2. U.S. National, 1783-1877
  - 3. U.S., 1877 to Present
  - 4. The Frontier and Western America
- B. Ancient History
  - 1. Greek History
  - 2. Roman History
- C. Medieval History
  - 1. Early Medieval History
  - 2. Later Medieval History
- D. Modern Europe
  - 1. Renaissance and Reformation
  - 2. Seventeenth and Eighteenth Centuries
  - 3. Nineteenth and Twentieth Centuries
- E. History of Asia
  - 1. Ancient Asia
  - 2. Modern Asia
- F. Latin-American History
  - 1. Colonial Period
  - 2. National Period

\*Areas of specialization other than those listed may be established upon approval of the committee chairman and the department chairman.

**Advisory Committee.** The Ph.D. advisory committee is determined by the Proposered Program of Courses which the student submits to the Graduate School. This program bears the signatures of the committee members and the department chairman. The committee will consist of three members of the history faculty and one member from the approved field outside history. The chairman will represent the area of specialization in which the dissertation will be written. After completion of the written and oral comprehensive examinations, the committee may be reorganized to include the chairman and two other members who are familiar with the dissertation subject.

**Languages.** The University language requirement is outlined in the graduate catalog. Soon after entrance into the doctoral program the student should contact the History Department language representative for instructions for specific procedures and help. Both languages, in the two-language option, must be passed before the student is eligible to take the comprehensive exams.

**Progress Review.** Near the end of the first year of work in the Ph.D. program, the advisory committee and, normally, two additional faculty members designated by the committee chairman, will conduct a comprehensive review of the student's progress. Any other interested faculty will be welcomed at the review. The review committee will evaluate the student's performance and provide whatever recommendation for or against continuance that it may deem advisable. Among the criteria examined will be course grades, reports from instructors, demonstrated research and writing ability, and performance on special essays to be administered during the first year of course work. Performance on the earlier master's oral and the Graduate Record Examination may also be considered. The candidate will be present at a portion of the review and may be questioned on his work at the committee's discretion.

To facilitate the task of appraisal, the candidate should inform each of his instructors of his status and ask them to administer a special Ph.D.-level essay or examination sometime during the course or in conjunction with the course final. The results of such tests are to be made available for the progress review.

**The Comprehensive Examination.** The written portion of the comprehensive examinations can be taken after the student has completed his minimum course requirements and passed the language exams. They should not be taken, however, before the student has read extensively in the fields to be covered by his examination.

The **written examinations** will be administered during a period of one week (five days), not to exceed four hours per day. They are scheduled by the depart-

ment chairman at the request of the student and upon recommendation of his committee chairman. The student will be tested in (1) the area of specialization within the major field, (2) the minor field, and (3) the outside field. The committee members representing the fields to be tested will examine the student's familiarity with basic historical facts, interpretations, and bibliography. All written examinations must be completed satisfactorily before the oral examination can be taken. In the event of failure, any examination may be repeated twice.

The **oral examination** may be taken as soon after passing the written exams as the student feels he is ready. On the oral exam, the student will be tested in (1) the major field, (2) the area of specialization in the major field, and (3) the minor field. (There will be no oral examination in the outside field.) The examination will probe bibliographical knowledge, interpretive and conceptual ability, and understanding of major movements.

**Dissertation.** The doctoral dissertation must represent a solid and original contribution to historical scholarship. It must reflect a thorough and critical use of the sources and a complete awareness of the implications of the dissertation and of other views of the materials or topic that it treats.

The dissertation prospectus, signed by members of the committee, must be filed at the Graduate School office at least six months before the degree is to be awarded. Copies of the dissertation must be provided for each member of the committee no later than April 1 (for May commencement) or July 1 (for August commencement). Any changes or rewriting required by the committee must then be done so that the approved dissertation (including an abstract) can be submitted to the Office of the Graduate School dean two weeks prior to the final defense of the dissertation. Microfilming and binding fees will also be paid at that time.

**Final Defense of the Dissertation.** Before the dissertation is officially accepted by the department, the candidate will be examined orally by a committee of five members, including the chairman. This examination must be given no later than three weeks prior to graduation. The candidate will defend the dissertation and explain the contribution which it makes to historical scholarship. Upon completion of the student's defense of his dissertation, the committee may recommend further changes before the dissertation is filed with the Graduate School.

### Courses

606. **Greek Thought.** (2:2:0) S. (Offered 1971-72 and alternate years) Swensen  
Study of Greek intellectual and philosophical thought, and its relationship to Greek institutions.
607. **Greek and Roman Historians.** (2:2:0) F. (Offered 1971-72 and alternate years) Swensen  
A critical study and reading of the works of these ancient historians, an evaluation of their historical methodology and interpretation, and their relations to their historical background.
608. **Roman Thought.** (2:2:0) S. (Offered 1972-73 and alternate years) Swensen  
A study of Roman intellectual, philosophical and scientific achievements and their relation to Roman institutions.
610. **Early Medieval Times.** (2:2:0) F. (Offered 1972-73 and alternate years) Schmutz  
Study of problems and interpretations in the history of the early Middle Ages from the fall of Rome to the mid-eleventh century.
611. **Later Medieval Times.** (2:2:0) (Offered 1972-73 and alternate years) Schmutz  
Study of problems and interpretations in the history of the late Middle Ages from the mid-eleventh century to the Renaissance.
612. **Medieval Thought and Culture.** (3:3:0) S. (Offered 1972-73 and alternate years) Swensen  
Study of the basic medieval achievements in philosophy, science, theology, literature, and education.

- 618. Problems in Early Modern Europe.** (3:3:0) F. (Offered 1972-73 and alternate years) Jensen  
Extensive reading, analysis, and interpretation of selected historical problems of the sixteenth, seventeenth, and eighteenth centuries.
- 621. Problems in Modern Europe.** (3:3:0) S. (Offered 1972-73 and alternate years) Cardon  
Extensive reading, analysis, and interpretation of selected historical problems of the nineteenth and twentieth centuries.
- 625. European Diplomatic History since 1815.** (2:2:0) F. Cardon  
Interprets "diplomacy" broadly. Emphasis on the relationship between European diplomatic history and the domestic history of the major world powers, including the U. S. and Russia.
- 628. European Thought and Culture to 1800.** (3:3:0) F. (Offered 1971-72 and alternate years) Jensen  
Intellectual and cultural movements of the sixteenth-eighteenth centuries. Emphasis is on humanism, reformation ideologies, the rise of scientific thought, rationalism, and the Enlightenment.
- 629. European Thought and Culture since 1800.** (3:3:0) S. (Offered 1971-72 and alternate years) Tobler  
The most influential intellectual and cultural movements of the nineteenth and twentieth centuries, their forms of expression, and their impact on the contemporary world.
- 633. Intellectual History of Germany.** (2:2:0) F. (Offered 1972-73 and alternate years) Prerequisite: reading knowledge of German. Tobler  
A study and analysis of the ideas which have had the most powerful influence upon the historical development of Germany since the Reformation.
- 635. Problems in Tudor and Stuart History.** (3:3:0) S. Thorp  
Examination of major sources and historical problems of sixteenth- and seventeenth-century England.
- 640. The Far East.** (2:2:0) S. Hyer  
Extensive reading, analysis, and interpretation of selected problems of Asian development with emphasis on China, Japan, and India.
- 648. Culture of Asia.** (2:2:0) F. Hyer  
Reading in depth and discussion of problems in Asian culture.
- 650. Latin America.** (2:2:0) S. (Offered 1972-73 and alternate years) Addy  
An advanced study of the generalized historical development of Latin America—colonial and national periods considered.
- 656. Southwestern United States.** (2:2:0) S. Hafen, Warner  
Selected problems in the area of Spanish colonization and United States fur trappers.
- 660. Problems in the History of the American West.** (3:3:0) F.Su. (Offered 1970-71 and alternate years) Alexander, Allen, Warner  
An analysis of the major interpretations and themes in the history of the American West.
- 666. Problems in Utah History.** (2:2:0) F. Campbell, Wood  
Reading in depth in the documents and discussion of interpretations of important events in Utah history.
- 667. Northwestern United States.** (2:2:0) S. Allen, Hafen  
History of the Oregon Territory as it developed into the states of Washington, Oregon, and Idaho.
- 670. Problems in Colonial America.** (3:3:0) F. (Offered 1971-72 and alternate years) Backman

672. **Problems in the Founding of the American Republic.** (3:3:0) S. (Offered 1971-72 and alternate years)
675. **Problems in the Early American Republic (1800-1848).** (3:3:0) F. Hill
677. **Problems in the Civil War and Reconstruction.** (3:3:0) S. (Offered 1971-72 and alternate years) C. R. Jensen
678. **Problems in the Emergence of Modern America (1880-1920).** (3:3:0) F. (Offered 1971-72 and alternate years) Alexander
679. **Problems in Contemporary American History.** (3:3:0) S. Marlow
681. **Sources and Problems in American Intellectual History.** (3:3:0) S. Prerequisites: Hist. 381, 382. Hill, Marlow  
Intensive reading of source materials in intellectual and social history.
686. **Seminar in Ancient History.** (3:3:0) S. Swensen
687. **Seminar in Medieval History.** (3:3:0) F. Schmutz
688. **Seminar in United States History to 1865.** (3:3:0) F.S.
689. **Seminar in United States History since 1865.** (3:3:0) F.S.
690. **Special Studies in History.** (2:2:0) F.S.  
Advanced research and analysis of important historical problems and movements. (By permission of instructor)
- Economics 691. Seminar in Economic History.** (2:2:0) Addy
691. **Seminar in Latin-American History.** (3:3:0) F.
692. **Seminar in Asian History.** (3:3:0) S. Hyer
693. **Seminar in European History to 1800.** (3:3:0) F.S. Jensen
694. **Seminar in European History since 1800.** (3:3:0) F.S. Cardon, Tobler
695. **Seminar in Western American History.** (3:3:0) F.S.Su.
- 697R. **Seminar in Utah History.** (3:3:0 ea.) F.S.
698. **Special Readings in History.** (1-2:0:Arr.) F.S.Su.
699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.
798. **Special Readings in History.** (1-2:0:Arr.) F.S.Su.
799. **Dissertation for Doctor's Degree.** (Arr.) F.S.Su.

## Home Economics Education

Associate Professor: Brasher (chairman, 2234-B SFLC).

### Graduate Program

The department offers training which leads to the Master of Science degree in home economics education. The student may elect a program without a minor which includes a series of courses in the College of Family Living or he may elect a minor in a department of the College of Family Living, the College of Education, or the Department of Sociology.

The specific selection of courses for a graduate degree is based upon the student's objectives and interests and is planned in consultation with the advisory committee.

Applicants will be expected to have academic training and professional experience in home economics education.

**Courses**

- 521R. Workshop in Home Economics Education.** (2:Arr.:Arr. ea.) Prerequisite: consent of instructor.  
Intensive study of application of principles and theory in home economics education.
- 530. Home Economics Education for Adults.** (2:2:0) Prerequisites: Home Ec. Ed. 489; consent of instructor.  
The principles, practices, programs, materials, and resources for teaching home economics education to adults.
- 532. Evaluation in the Teaching of Home Economics Education.** (2:2:0) Pre-requisite: Ed. 479 or consent of instructor.  
Analysis of evaluation techniques and construction of evaluation devices unique to home economics.
- 630. Methods and Curriculum in Home Economics Education.** (3:3:0)  
Intensive study of methods of teaching and curriculum development for home economics education programs in the secondary schools.
- 650. Organization and Administration of Home Economics Education Programs.** (3:3:Arr.)
- 689. Social Foundation of Home Economics Education.** (3:3:Arr.)  
Examination of social, economic, and educational forces which affect individuals and families.
- 693R. Independent Readings and Conference.** (1-3:Arr.:Arr. ea.)
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## **Humanities and Comparative Literature**

**Professors:** R. Britsch (A 113-A JKBA), Spears.

**Assistant Professor:** T. Britsch.

### **Comparative Literature**

The program in comparative literature is based on a belief that literature, like the other arts, transcends national and linguistic boundaries and that many students will wish to extend their knowledge and enjoyment of poetry, fiction, and similar writings beyond the limits of English and American literature. The student of literature with an aptitude for languages can probably master his subject most effectively if he gains a firm knowledge of at least one national literature and at the same time makes a careful study of literary masterpieces of other languages, in the original tongues and in translation. In the comparative literature area of the department the student has opportunity (a) to develop his ability to read and evaluate literature, (b) to gain a broader awareness of literary history than he could through the study of a single literature, (c) to become aware of the interrelatedness of the great traditions of literature, and (d) to develop techniques for the study of problems that involve more than one literature.

In addition to completing a number of courses offered by the department, the major will round out his program with courses in literature offered by the departments of English and the various languages. These courses will be selected under the supervision of his adviser.

### **Requirements for the M.A. Degree in Comparative Literature**

The candidate for the master's degree in comparative literature must complete the following program:

1. **Course Requirements.** A minimum of 31 approved hours, including 20 hours of graduate courses. The 31 hours include
- |  | Hours |
|--|-------|
| A. Comp. Lit. 610, Methods of Study in Comparative Literature .....  | 3     |
| B. At least one course from the Comp. Lit. 471-475 series in addition to any taken on the undergraduate level .....  | 3     |
| C. From the courses in literature offered by the English and language departments: major emphasis on one ancient or modern literature (for example, Latin or German or English) and minor emphasis on another. In the major area (9 hours or more), at least two of the courses must be on the graduate level; in the minor area (5 hours or more), at least one course must be on the graduate level. Work must be done in the original languages. Major emphasis should also be placed on one era or period (for example, classicism or romanticism) and minor emphasis on another ..... | 14    |
| D. A bibliography and research course offered in the candidate's major or minor area of emphasis (for example, French 601 or Engl. 615) .....  | 2     |
| E. One graduate seminar in comparative literature .....  | 3     |
| F. Thesis .....  | 6-9   |
2. **Language Requirements.** A reading knowledge of at least two foreign languages. It is recommended that one of the two be Greek or Latin. The candidate will demonstrate competence in at least one of these two languages by meeting the course requirements outlined above. He will show competence in the other, if necessary, by passing an examination in the language prior to the completion of his master's program.

#### Courses

- 471. Literature of the Middle Ages.** (3:3:0) S. 1972. (m) McKendrick, Spears  
A comparative study of English and Continental European literature of the Middle Ages.
- 472. Literature of the Renaissance.** (3:3:0) S. 1973 (m) Evans, Spears  
A comparative study of English and Continental European literature of the Renaissance.
- 473. Literature of the Enlightenment.** (3:3:0) S. 1972 (m) Evans, Spears  
A comparative study of English, American, and Continental European literature of the Age of Enlightenment.
- 474. The Romantic Movement.** (3:3:0) F. 1972 (m) Farnsworth, Spears  
A comparative study of romanticism in the literature of England, America, and Continental Europe.
- 475. Realism and the Modern Age.** (3:3:0) F. 1971 (m) Evans, Spears  
A comparative study of English, American, and Continental European literature of the later nineteenth and twentieth centuries.
- 490R. Seminar in Comparative Literature.** (3:3:0 ea.) S. (m)  
Reading, analysis, and presentation of papers concerning selected topics in comparative literature. Basic topics vary from semester to semester; course may be repeated for credit.
- 495R. Individual Readings in Comparative Literature.** (1-2:Arr.:0 ea.)  
For comparative literature majors only, with permission of department chairman.
- 610. Methods of Study in Comparative Literature.** (3:3:0) F. Prerequisite: consent of instructor.  
Approaches to the study of relationships among literatures and to analysis of types, genres, styles, etc.; definition of movements and periods.

- 690R. Seminar in Comparative Literature.** (3:3:0 ea.) S. Prerequisite: Comp. Lit. 610 or consent of instructor.  
Selected problems in comparative literature. Course content will vary from semester to semester.
- 695R. Individual Readings in Comparative Literature.** (1-2:Arr.:Arr. ea.) For graduate majors in comparative literature only, with permission of department chairman.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Industrial Education

**Professors:** Hinckley (chairman, 250 SNLB), Jeppsen, McArthur.

**Associate Professors:** Grover, McKell, Mortensen, Nish.

**Assistant Professor:** Simmons.

The Industrial Education Department offers graduate programs leading to the Master of Science and Master of Industrial Education degrees. Both programs require a minimum of thirty-three semester hours.

The Master of Science degree requires completion of a thesis and is recommended for anyone contemplating future graduate work leading to the specialist or Doctor of Education degree.

The Master of Industrial Education degree requires completion of a field project and prior teaching experience. It is designed to further develop the educational and technical background of the professional teacher.

Option I or II may be used with both programs.

### Master of Science

Majors: Industrial arts education, technical education, industrial technology.

Suggested Minors: Education and psychology, guidance and counseling, education media, special education, supervision and administration, community school, junior college curriculum, business management.

Major Requirements: Ed. 660; Stat. 552; Indus. Ed. 699 and a minimum of fourteen semester hours selected from Indus. Ed. 505, 535, 540, 593A,B,C, 610, 615, 620, 625, 630, 635, 640, 645, 650, 690, 691, 694R, 695R, Ed. 550, 560, and Indus. Tech. 511, 530, 531, 535, 555, 590R.

Minor Requirements: Nine to ten semester hours selected in consultation with the minor adviser. See above list of suggested minors.

Research and Thesis: Ed. 660; Stat. 552; Indus. Ed. 694, 699.

Entrance Requirements: In addition to the general Graduate School requirements for the master's degree, the Industrial Education Department requires satisfactory completion of thirty semester hours in acceptable industrial and technical education undergraduate courses prior to or concurrent with the graduate work or a minimum of six years of bona fide trade experience. (Although not required, a minimum of one year of teaching experience in industrial education or industrial experience will give much more meaning to the graduate work.)

### Master of Industrial Education

Majors: Industrial arts education, technical education

Suggested Minors: Art, education media, education and psychology, special education, guidance and counseling, junior college curriculum, educational supervision and administration, community school.

Major Requirements:  
Indus. Ed. 610. History and Trends in Industrial and Technical Education **or**

Indus. Ed. 615. Principles and Objectives of Industrial and Technical Education	2 hrs.
Indus. Ed. 695R. Problems in Indus. and Tech. Ed.	2 hrs.
Indus. Ed. 690. Seminar	1 hr.
Indus. Ed. 694R. Reading and Conference	2 hrs.
Ed. 560. Educational Tests and Measurements	3 hrs.
Indus. Ed. 645. Visual and Graphic Materials in Industrial Education	2 hrs.
A minimum of twelve semester hours selected from the following:	
Indus. Ed. 505, 535, 540, 593A,B,C, 610, 615, 620, 625, 630, 635, 640, 650, 691	<u>12 hrs.</u>
	<u>Minimum Major Total</u>
	<u>24 hrs.</u>

**Minor Requirements:** Nine to ten semester hours selected in consultation with the minor adviser. See above list of suggested minors.

**Credit Requirements:** A minimum of thirty-three semester hours.

**Field Project:** The project topic will be determined in consultation with the major adviser. No credit will be given until the project has been accepted by the department.

**Oral Examination:** A one-hour oral examination on course work with a committee consisting of the major adviser, an additional representative of the major department, and the minor adviser.

**Entrance Requirements:**

1. A valid industrial education teaching certificate.
2. A minimum of one year of successful teaching experience in industrial education.

#### Courses

**505. Industrial Arts for Elementary Teachers.** (2:2:0) F.Su.

Nature and needs of teachers instructing industrial arts in the elementary schools with emphasis on content and procedures.

**Indus. Tech. 511. Computer-aided Drafting.** (3:3:2) S.

**Indus. Tech. 530. Plant Layout and Materials Handling.** (3:3:0) S.

**Indus. Tech. 531. Advanced Manufacturing Processes.** (3:3:0) F.

**535. Industrial Education Safety and Liability.** (2:2:0) S.Su.

Principles of accident causes and prevention in industrial education laboratories. Teacher and student responsibility regarding liability; present laws affecting school safety.

**Indus. Tech. 535. Advanced Physical Metallurgy.** (3:3:0) F.

**540. Industrial Occupational Information and Guidance.** (2:2:0) S. Su.

**Statistics 552. Statistical Methods in Education I.** (3:3:0)

**Indus. Tech. 555. Mechanical Forming Methods.** (3:3:0) S.

**Education 560. Educational Tests and Measurements.** (3:3:0)

**Indus. Tech. 590R. Special Problems in Manufacturing.** (1-3:Arr.:Arr. ea.) F.S.Su.

**593A,B,C. Workshop in Industrial Education.** (1-3:Arr.:Arr. ea.) F.S.Su.

Instruction in current industrial and technological advances related to industrial education.

**610. History and Trends in Industrial and Technical Education.** (2:2:0) F.Su.

Historical developments of industrial and technical education programs from their early beginnings to the present time.

**615. Principles and Objectives of Industrial and Technical Education.** (2:2:0) F.Su.

General philosophy, principles, and objectives of industrial arts, vocational education, and technical education programs.

- 620. Analysis in Industrial and Technical Education.** (2:2:0) F.Su. Prerequisite: Indus. Ed. 615 or consent of instructor.
- 625. Course Construction in Industrial and Technical Education.** (2:2:0) S.Su. Prerequisite: Indus. Ed. 620 or consent of instructor.  
Preparation and use of a course of study in industrial and technical fields based upon an analysis of the occupation.
- 630. Problems of Adult Industrial Education.** (2:2:0) F.Su.  
Development of the adult industrial education movement and the problems relative to teaching adults, with emphasis on continuing education.
- 635. Planning and Equipping Industrial and Technical Programs.** (2:2:0) S.Su. Prerequisite: Indus. Ed. 625.  
A study of industrial and technical school laboratories designed to facilitate and supervise instruction in industrial arts, vocational education, and technical education.
- 640. Coordination and Supervision of Industrial and Technical Education.** (2:2:0) F.Su. Prerequisite: Indus. Ed. 625.  
Methods of supervision and coordination of industrial arts, vocational education, and technical education programs including laws, regulations, and policies affecting these programs.
- 645. Visual and Graphic Materials in Industrial Education.** (2:1:2) S.Su.  
Basis for the selection, development, and use of visual and graphic materials and their contribution to facilitating instruction in industrial and technical education.
- 650. Design in Industrial Education.** (2:1:3) F.Su.  
Design procedures and evaluation relative to aesthetics, material characteristics, and manufacturing processes; design implementation in the laboratory; applicable drafting techniques.
- Education 660. Research Design and Technical Writing in Education.** (3:3:0)
- 690, 691. Seminar.** (1:1:0 ea.) Su.  
Latest developments and research findings in the field of industrial and technical education are reviewed.
- 694R. Reading and Conference.** (1-3:1-3:0 ea.) F.S.Su.  
Limited to a maximum of 6 credit hours.
- 695R. Problems in Industrial and Technical Education.** (1-3:1-3:3-9 ea.) F.S.Su.  
Designed to strengthen the student in a given area of instruction provided in the industrial education program. Limited to a maximum of 6 credit hours.
- 698. Field Project.** (2-4:Arr.:Arr.) F.S.Su.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Institute of Government Service

**Distinguished Professor:** Grow (Political Science).

**Professors:** Dyer (Sociology), Moffitt (Psychology).

**Associate Professors:** Buckwalter (Political Science), Daniels (Psychology), Harlow (Organization and Management), Snow (director, CRWH—Political Science).

The basic mission of the Institute of Government Service is to prepare students for positions of leadership in the public service. The program is also designed to serve those who may seek positions with public and private governmental research organizations, as well as those who may find employment with a wide variety of semiprivate organizations whose purposes are public.

The Institute of Government Service awards a Master of Public Administration (MPA) degree upon recommendation of the faculty at the successful completion of forty-eight semester hours of approved graduate credit. The MPA degree is intended as a two-year (or one school year and two summers) professional and terminal degree—supported by studies in (1) administrative and organizational analysis, (2) political and organizational environment of public administration, (3) interpersonal behavior, (4) public policy and decision making, and (5) public finance and public personnel administration.

### **Administration of the Program**

The program is administered by the director of the Institute of Government Service appointed by the dean of the College of Social Sciences in consultation with the dean of the Graduate School.

### **Entrance Requirements**

To be admitted to the program an applicant must possess the bachelor's degree from an accredited university and meet the requirements of Brigham Young University for admission to graduate study. Students may be admitted from a variety of backgrounds including political science, sociology, psychology, geography, economics, and accounting. When application for admission is made, each applicant will be advised of any background deficiencies.

Students entering the program without sufficient background in American government may be required to take Political Science 310 and/or Political Science 311. Political Science 330, Introduction to the Study of Public Administration, is required of every student for full acceptance into the program. If this course has not been taken as an undergraduate student, it may be starred for graduate credit and taken immediately upon entry into the program.

Application to the Institute of Government Service may be made at the same time the student applies for acceptance to the Graduate School. Applications for Fall Semester must be filed by July 1; and for Summer School by April 1 of each year. Graduate Record Examination general aptitude scores must be submitted before the application deadline.

### **Requirements for the Degree**

The Master of Public Administration degree may be awarded following the completion of the following requirements:

#### **1. Required Courses**

Political Science 330 - Introduction to Public Administration  
And the following thirty semester units:  
Political Science 530 - Quantitative Analysis in Public Administration  
Political Science 532 - Public Personnel Administration  
Political Science 533 - Public Finance Administration  
Political Science 540 - Public Management Control Systems  
Political Science 630 - Administrative Analysis  
Political Science 632 - Public Policy Development and Program Planning  
Political Science 633 - Contemporary Issues and Public Administration  
Political Science 694 - Project in Public Administration  
Organization Behavior 640 - Behavioral Approaches to Organizational Processes  
Business Management 616 - Organizational Behavior

#### **2. Area of Specialization**

In addition to the above each student is required to develop, with the help of an adviser, an area of specialization for the remaining 15 or 18 semester units. The following areas of specialization may be developed from approved course work offered through the Departments of Political Science, History, Sociology, Psychology, Economics, Statistics, Computer Science, and Organization Behavior:

- a. State and Local Government Administration

- b. American Government
  - c. Urban and Regional Planning
  - d. International Administration—the Administration of Technical Assistance Programs
  - e. Organizational and Administrative Research
  - f. Administration of Financial Resources
  - g. Personnel Administration
  - h. Law Enforcement
3. Recommendation of the faculty following a comprehensive examination administered during the student's final semester of course work.

#### **Law Enforcement**

Graduate education in law enforcement is administered through the Institute of Government Service. Required graduate courses for the Master of Public Administration degree with law enforcement as an area of specialization are prescribed by the coordinator of law enforcement in consultation with the director of the Institute of Government Service.

## **LANGUAGES**

#### **Requirements**

It is expected that the graduate student in languages will meet all the general requirements for advanced degrees as outlined by the Graduate School. Special requirements of the individual language departments are given below.

#### **Master of Arts Degree**

For full graduate standing in French, German, Latin, Portuguese, and Spanish, students must have a B.A. in the language chosen as a major or have an equivalent background. M.A. candidates are expected to have a good reading knowledge of one foreign language, in addition to proficiency in their major language. Provisional admission may be granted only on the recommendation of the department chairman. Minors in these fields must have a fluent reading knowledge of the language elected.

The language major consists of a minimum of nineteen hours of course work exclusive of the thesis. The major or minor emphasis in foreign language may be in literature, language, or foreign language teaching methodology, according to the various offerings and requirements of the individual language departments. Under Option I, the minor must consist of at least nine semester hours in a field approved by the major department. Under Option II, the twenty-eight semester hours of course work and the six hours allowed for a thesis must be in the major field or in direct support of the major field. The choice of major-minor combination by the student majoring in a foreign language is subject to the approval of his advisory committee.

#### **Doctor of Philosophy Degree**

Departmental requirements for a Ph.D. degree in French, German, or Spanish language, literature, or language teaching include the following:

1. **Admission Requirement:** A Bachelor of Arts or a Master of Arts degree.
2. **Residence Requirement:** At least two semesters of continuous residence beyond the M.A. level must be spent on the BYU campus, and during that time a minimum of not less than nine semester hours of course work each semester must be completed at this University.

While it will be possible for a well-prepared student to complete the course work for the Ph.D. degree in three years after receiving the B.A.

degree, it should be understood that this minimum time requirement is secondary to other considerations which are explained in the following paragraphs.

**3. Special Examinations:**

- a. **Departmental Screening Examination:** To be taken before the beginning of the second year of graduate work.
- b. **Comprehensive Examinations:** A student must pass comprehensive written and oral examinations on his doctoral fields under the direction of his major department. These examinations will be given upon completion of all course work.
- c. **Final Oral Examination:** Not later than twenty days before graduation the student must pass a final examination on his dissertation and applicable subject matter given by a committee of not fewer than five members. The committee consists of the advisory committee, plus such other members as the department chairman and the dean of the Graduate School may designate.

**4. Foreign Languages Required:**

- a. **French Majors:** A reading knowledge of German, Latin, and one other romance language, in addition to fluent speaking, reading, and writing ability in French.
- b. **German Majors:** A reading knowledge of either French or Spanish and another approved language, in addition to fluent speaking, reading, and writing ability in German. A major in Germanic linguistics should also have either Latin or Greek.
- c. **Spanish Majors:** A reading knowledge of German, Latin, and one other romance language, in addition to fluent speaking, reading, and writing ability in Spanish.

The requirements for the languages listed above must be satisfactorily completed before the date of the comprehensive examination.

**5. Course Requirements for the Major:** A minimum of forty-two hours of prescribed course work beyond the B.A. degree which will include courses in literature and culture, philology, and teaching methodology. Additional requirements will be determined according to the needs of the individual student.

**6. Course Requirements for the Minor:** The minor will consist of twenty hours of approved graduate courses in another language or in related supportive fields approved by the graduate faculty of the individual language departments.

## Classical and Asian Languages

**Professor:** Clark (chairman, 329 MCKB).

### Classical Languages

#### GREEK

#### Courses

- 611. Readings in Greek: The Gospel and Acts.** (3:3:0) Prerequisite: one year of Greek or consent of instructor.
- 612. Readings in Greek: Paul's Letters.** (3:3:0) Prerequisite: one year of Greek or consent of instructor.
- 613. Readings in Greek: General Epistles and the Apocalypse.** (3:3:0) Prerequisite: one year of Greek or consent of instructor.

**LATIN****Courses**

- 520. Advanced Composition and Grammar.** (2:2:0) Prerequisite: Latin 322 or equivalent. Clark
- 521. Romance Philology.** (2:2:0) Clark
- 561, 562. Elementary and Advanced Medieval Latin.** (2:2:0 ea.) Prerequisite: Latin 301 or 112 or equivalent. Clark, Phillips
- 661. Cicero.** (3:3:0) Clark, Phillips
- 665. The Latin Historians.** (2:2:0) Clark, Phillips
- 671. Virgil.** (3:3:0) Clark, Phillips
- 675. The Latin Poets.** (3:3:0) Clark, Phillips  
Horace, Ovid, Lucretius, etc.
- 679. The Latin Dramatists.** (3:3:0) Clark, Phillips  
Plautus, Terence, etc.
- 681, 682. The Latin Fathers.** (3:3:0 ea.) Prerequisite: consent of instructor. Phillips
- 690R. Directed Readings.** (1-2:Arr.:0 ea.) Individual study on a graduate level. Clark, Phillips
- 692R. Seminar in Philology.** (2:2:0 ea.) Clark, Phillips
- 694R. Seminar in Literature.** (2:2:0 ea.) Clark, Phillips
- 699. Thesis for Master's Degree.** (6-9:Arr.:0)

**Semitic Languages****AKKADIAN****Courses**

- 781, 782. Elementary Akkadian.** (3:3:0 ea.) F.S. Prerequisite: two years of biblical Hebrew.

**COPTIC****Courses**

- 641, 642. Introduction to Coptic.** (3:3:0 ea.) Prerequisite: consent of instructor.

**EGYPTIAN****Courses**

- 641. Elementary Egyptian.** (3:3:0) Prerequisite: consent of instructor.
- 642. Elementary Egyptian.** (3:3:0) Prerequisite: Egyptian 641 or consent of instructor.

**HEBREW****Courses**

- 681. Studies in the Hebrew Old Testament.** (3:3:0) Prerequisite: two years of Hebrew or consent of instructor.
- 682. Studies in Hebrew.** (3:3:0) Prerequisite: Hebrew 681.

**SYRIAC****Courses**

- 781. Elementary Syriac.** (5:5:0) Prerequisite: two years of biblical Hebrew or one year of Aramaic.
- 782. Elementary Syriac.** (3:3:0) Prerequisite: Syriac 781.

**UGARITIC****Courses**

- 781, 782. Elementary Ugaritic.** (3:3:0 ea.) Prerequisite: two years of biblical Hebrew.

**French and Italian**

**Professors:** Brown,\* Green (chairman, 357 MCKB), Lee (graduate coordinator, 366 MCKB).

**Associate Professors:** H. Clark, Turner.

**Assistant Professors:** Heudier, Kimball, Lambert.

**FRENCH**

The M.A. degree in French requires a minimum of twenty-eight hours of course work, including both the major and the minor, plus the thesis. Candidates for the M.A. degree may elect either Option I or II.

**Option I.** Nineteen hours in the major, nine hours in a single minor such as another language (including English), history, etc.

**Option II.** Sixteen to twenty hours in the major, eight to twelve hours in a supportive minor (major and supportive minor must total at least twenty-eight hours, exclusive of thesis). This type of minor allows the student to work in several fields which closely support the major and/or thesis topic.

The Ph.D. degree requires a minimum of sixty-two hours of course work beyond the B.A., with a minimum of forty-two hours in the major field and twenty in the minor. The minor may be in a single subject area, or it may be drawn from more than one area to form a supportive minor (similar to Option II in the M.A. program).

**Courses**

- |  |                             |
|--|-----------------------------|
| <b>511. Advanced Conversation for Students of Institute.</b> (0:2:1) |                             |
| <b>520. French Composition and Grammar.</b> (2:2:0)                  |                             |
| <b>521. Romance Philology.</b> (3:3:0)                               | R. Clark                    |
| <b>522. History of French Language.</b> (2:2:0)                      | R. Clark                    |
| <b>560. Old French Literature.</b> (3:3:0)                           | Heudier                     |
| <b>565. French Literature of the Renaissance.</b> (2:2:0)            | Heudier                     |
| <b>570. French Literature of the Seventeenth Century.</b> (2:2:0)    | Green                       |
| <b>575. French Literature of the Eighteenth Century.</b> (2:2:0)     | Lambert                     |
| <b>580. French Literature of the Nineteenth Century.</b> (3:3:0)     | H. Clark, Green,<br>Kimball |
| <b>585. French Literature of the Twentieth Century.</b> (2:2:0)      | Lee                         |

**601. Bibliography and Research Techniques.** (1:1:0)

- 626. French Phonology.** (2:2:2) Prerequisite: French 326 or consent of instructor. Recommended for teachers.
- 629. Stylistics.** (2:2:0) Intensive linguistic and literary analysis of French, especially from modern writers: syntax, translation, advanced stylistic analysis, and advanced explication of texts.
- 645R. Advanced Studies in French Civilization.** (2:2:0 ea.) Prerequisite: French 445 or consent of instructor. For teachers. Lee
- 661R. Seminar in Medieval French Literature.** (2:2:0 ea) Heudier
- 666R. Seminar in French Literature of the Renaissance.** (2:2:0 ea.) Heudier
- 671R. Seminar in French Literature of the Seventeenth Century.** (2:2:0 ea.) Green
- 676R. Seminar in French Literature of the Eighteenth Century.** (2:2:0 ea.) Lambert
- 677R. Principles of Foreign Language Learning and Teaching.** (2:2:0 ea.) Pre-requisite: French 377 or consent of instructor. Green, Miller
- 681. French Drama of the Nineteenth Century.** (2:2:0) H. Clark, Green, Kimball
- 682, 683. French Novel of the Nineteenth Century I, II.** (2:2:0 ea.) H. Clark, Green, Kimball
- 684R. Seminar in French Literature of the Nineteenth Century.** (2:2:0 ea.) H. Clark, Green, Kimball
- 686R. Seminar in French Literature of the Twentieth Century.** (2:2:0 ea.) Lee
- 687, 688. Modern French Novel I, II.** (2:2:0 ea.) Lee
- 689. Modern French Drama.** (2:2:0) Lee
- 690R. Directed Readings.** (1-2:Arr.:0 ea.) Prerequisite: consent of instructor. Individual study on a graduate level, to fit the needs of the graduate student. Not to be taken in lieu of classes.
- 692R. Seminar in Philology.** (1-2:1-2:0 ea.) R. Clark
- 695R. Seminar in French Literature.** (2:2:0 ea.)
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)
- 721. Romance Dialects.** (3:3:0) R. Clark
- 723. Old French Phonology and Morphology.** (2:2:0) R. Clark
- 760R. Seminar in Medieval French Literature.** (2:2:0 ea.) Heudier
- 765R. Seminar in French Literature of the Renaissance.** (2:2:0 ea.) Heudier
- 770R. Seminar in French Literature of the Seventeenth Century.** (2:2:0 ea.) Green
- 775R. Seminar in French Literature of the Eighteenth Century.** (2:2:0 ea.) Lambert
- 780R. Seminar in French Literature of the Nineteenth Century.** (2:2:0 ea.) H. Clark, Green, Kimball
- 785R. Seminar in French Literature of the Twentieth Century.** (2:2:0 ea.) Lee
- 792R. Seminar in Philology.** (2:2:0 ea.) R. Clark
- 799. Dissertation for the Ph.D. Degree.** (1-6:Arr.:0)

## Germanic and Slavic Languages

**Professors:** Folsom, Rogers, Watkins (chairman, 326 MCKB).

**Associate Professors:** Davis, Kelling, Smith (graduate coordinator, 321 MCKB), Speidel.

**Assistant Professors:** Baker, Britsch, Roos.

### GERMAN

#### Courses

- 601. Bibliography and Research Techniques.** (1:1:0) Prerequisite: graduate status. Allen, Davis, Kelling
- 615. Teaching German Grammar.** (2:2:0) Prerequisites: Ling. 325 and German 326 or consent of instructor. Folsom, Watkins  
An analysis and organization of German morphology and syntax for effective teaching of German grammar.
- 620. History of the German Language.** (3:3:0) Prerequisite: graduate status. Folsom, Watkins
- 622. Gothic.** (3:3:0) Folsom, Watkins
- 623. Old High German and Old Saxon.** (3:3:0) Folsom, Watkins
- 626. German Phonology.** (2:2:0) F.S. Prerequisite: German 326 or consent of instructor. Folsom  
A study of the sounds of German and its stress, rhythm and intonation patterns, contrasted and compared with those of English.
- 628, 629. Middle High German I, II.** (3:3:0 ea.) Folsom, Watkins
- 650. Literary Criticism.** (2:2:0) F.S. Prerequisite: graduate status or consent of instructor. Allen, Davis, Kelling, Speidel  
Modern critical theory and analysis of German literary works.
- 670. German Baroque Literature.** (3:3:0) Prerequisite: graduate status. Allen, Davis, Roos
- 681. German Romanticism.** (3:3:0) Prerequisite: graduate status. Speidel
- 683. German Realism.** (3:3:0) Prerequisite: graduate status. Allen, Baker
- 689. Contemporary German Literature.** (3:3:0) S. Kelling, Smith  
Prerequisite: consent of instructor.
- 690R. Directed Readings.** (2:Arr.:0 ea.)
- 692R. Seminar in Philology.** (2:2:0 ea.) Special problems and topics of relevance in German philology. Topics and instructors to be announced.
- 694R. Seminar in Literature.** (2:2:0 ea.) Intensive analysis of a particular writer, a major work, or a limited theme. Training in independent literary research. Topic and professor change each semester.
- 697R. Seminar in the Teaching of German.** (2:2:0 ea.) F.S. For experienced language teachers. Davis, Folsom, Rogers, Taylor, Watkins  
Latest developments and research in various aspects of language teaching.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)
- 741. German Lyric Poetry.** (2:2:0) Allen, Britsch, Kelling
- 742. The German Drama to 1880.** (3:3:0) Prerequisite: graduate status. Allen, Rogers
- 743. The German Drama from 1880 to Present.** (3:3:0) Prerequisite: graduate status. Britsch, Rogers

- 744. The German Novel to 1880.** (3:3:0) Baker, Speidel
- 745. The German Novel from 1880 to Present.** (2:2:0) Smith, Speidel
- 746. The German Short Story.** (3:3:0) Prerequisite: graduate status. Smith
- 776. Lessing.** (2:2:0) Davis, Rogers
- 777. Schiller.** (2:2:0) Davis, Smith
- 778. Goethe.** (2:2:0) Allen, Kelling
- 792R. Seminar in Philology.** (2:2:0 ea.) Advanced investigation and analysis of special problems and topics in Germanic philology. Topics and professors will vary.
- 794R. Seminar in Literature.** (2:2:0 ea.) Advanced research and analysis of a limited theme or particular writer. Subject will vary. Topic and professor to be announced.
- 799. Dissertation for the Ph.D. Degree.** (Arr.)

## Spanish and Portuguese

**Professors:** Compton, de Jong, Dowdle, Gibson (chairman, 303 MCKB), Hansen, Wilkins.

**Associate Professors:** Anderson, Moon, Rosen, Shreeve, Taylor.

**Assistant Professors:** Ashworth, Jackson, Quackenbush.

### PORTUGUESE

#### Courses

- 521. Romance Philology.** (3:3:0) Clark
- 522. History of the Portuguese Language.** (2:2:0) S. Gibson, Jensen
- 552. Machado de Assis.** (2:2:0) Prerequisites: Portuguese 431, 432, or equivalent. de Jong, Dennis
- 553. O Modernismo.** (2:2:0) Prerequisites: Portuguese 431, 432, or equivalent. de Jong, Dennis, Jensen  
The modern movement in Brazilian literature (1920-1945).
- 620, 621. Portuguese Composition.** (3:3:0 ea.) de Jong
- 642. Contemporary Portuguese Literature.** (3:3:0) de Jong
- 650. Brazilian Literature.** (3:3:0) de Jong
- 651. Contemporary Brazilian Literature.** (3:3:0) de Jong
- 690. Directed Readings.** (1-2:0:Arr.)
- 692. Seminar in Philology.** (2:2:0) de Jong
- 694R. Seminar in Literature.** (2:2:0 ea.)
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

### SPANISH

#### Courses

- 520. Advanced Spanish Composition and Grammar.** (2:2:0)

521. Romance Philology. (3:3:0) Clark
522. History of the Spanish Language. (2:2:0) Dowdle, Gibson
556. Hispanic-American Poetry. (3:3:0) Compton, Quackenbush
580. Nineteenth-Century Spanish Drama and Poetry. (3:3:0) Prerequisite: Spanish 441 or consent of instructor. Ashworth, Dowdle, Gibson
581. The Nineteenth-Century Spanish Novel. (3:3:0) Prerequisite: Spanish 441 or consent of instructor. Ashworth, Dowdle, Gibson
584. Generation of '98. (3:3:0) Anderson, Moon
601. Bibliography and Research Techniques. (2:2:0) Rosen, Taylor
615. Teaching Spanish Grammar. (2:2:0) Anderson
626. Spanish Phonology. (2:2:0) F.S.Su. Prerequisite: Spanish 326 or consent of instructor. Anderson
654. The Spanish-American Novel: Beginnings. (2:2:0) Compton, Hansen, Quackenbush
655. The Spanish-American Novel: Contemporary. (2:2:0) Compton, Hansen, Quackenbush
656. The Modernista Movement. (2:2:0) Compton, Quackenbush
658. Hispanic-American Short Story. (2:2:0) Compton, Quackenbush
660. Spanish Medieval Literature. (2:2:0) Dowdle, Gibson
670. Golden-Age Drama. (3:3:0) Dowdle, Gibson, Moon, Rosen
671. Golden-Age Prose. (2:2:0) Dowdle, Gibson, Moon, Rosen
672. Golden-Age Poetry. (2:2:0) Dowdle, Gibson, Moon, Rosen  
Nondramatic.
677. Principles of Foreign Language Learning and Teaching. (2:2:0) Jackson, Taylor
- 685, 686. Twentieth-Century Literature. (2:2:0 ea.) Ashworth, Moon
- 690R. Directed Readings. (1-2:Arr.:Arr. ea.) Prerequisite: consent of instructor.  
Individual study on a graduate level to fit the needs of the graduate student.
692. Seminar in Philology. (2:2:0) Anderson, Clark, Gibson
- 694R. Seminar in Spanish Literature. (2:2:0 ea.)
- 697R. Seminar in Spanish Teaching. (2:2:0 ea.) Anderson, Jackson, Rosen, Taylor  
For experienced language teachers.
699. Thesis for Master's Degree. (6:Arr.:Arr.)
721. Romance Dialects. (3:3:0) Clark
741. The Spanish Poetic Tradition. (2:2:0)
742. The Development of Spanish Drama. (2:2:0) Rosen
744. Spanish Novelistic Prose. (2:2:0) Moon
773. Cervantes. (2:2:0) Rosen
774. Lope de Vega. (2:2:0) Gibson, Rosen
- 792R. Seminar in Philology. (2:2:0 ea.) Anderson, Gibson
- 794R. Seminar in Literature. (2:2:0 ea.)
799. Dissertation for the Ph.D. Degree. (Arr.)

## Latin-American Studies

**Associate Professor:** Shreeve (coordinator, 113 FOB).

The Latin-American Studies Program is an interdepartmental and intercollege area program which offers a concurrent major for the Master of Arts degree and a minor at the M.A. level.

### Requirements

For entry into the program a student will be expected to have completed the usual Graduate School requirements and to have some undergraduate preparation in Latin-American studies. Where deficiencies exist, the student, in consultation with his graduate committee, will be expected to remedy such deficiencies.

#### A. Concurrent Majors for an M.A. in Latin-American Studies

1. A major in one of the departments of the University (all departmental requirements must be fulfilled for the major).
2. Proficiency in the Spanish or Portuguese language to be determined by examination, or successful completion of Spanish 321 or Portuguese 321. Where a student already has fluency in one of these languages he is encouraged to seek proficiency in the other, or in a native language (Cakchiquel, Quechua, Guarani, etc.) of Latin America.
3. At least fifteen hours in approved Latin-American content courses and including one seminar—Latin-American Studies 690A,B. No courses taken to fill the Latin-American studies major may be counted toward the departmental major.
4. A thesis on a Latin-American subject acceptable to both majors (the same thesis will fill the requirements for both majors).

#### B. Graduate Minor in Latin-American Studies

1. Proficiency in Spanish or Portuguese.
2. Nine hours in graduate-level courses in Latin-American related subjects and including one seminar—Latin-American Studies 690A,B.

### Graduate Course Offerings in Latin-American Studies

(See respective departmental offerings for additional course details.)

#### Archaeology:

- Arch. 631. Introduction to Mesoamerican Hieroglyphics and Iconography. (2 hours)
- Arch. 651R. Advanced Field Methods of Archaeology (Mexico or Central America). (5 hours ea.)
- Arch. 695R. Library Research. (2 hours ea.)

#### Business:

- Bus. Mgt. 430. Introduction to International Business (Latin-American emphasis). (3 hours)
- Bus. Mgt. 431. International Marketing (Latin-American emphasis). (3 hours)
- Bus. Mgt. 432. International Corporate Finance (Latin-American emphasis). (3 hours)

#### Communications:

- Commun. 580. Comparative World Communication Systems (Latin America). (2 hours)

#### Geography:

- Geog. 556. South America. (2 hours)
- Geog. 557. Caribbean Area. (2 hours)
- Geog. 580. Geography of Underdeveloped Areas. (2 hours)

**History:**

- Hist. 650. Latin America. (2 hours)  
 Hist. 691. Seminar in Latin-American History. (3 hours)

**Languages:**

- Port. 552. Machado de Assis. (2 hours)  
 Port. 553. O Modernismo. (2 hours)  
 Port. 620. Portuguese Composition. (3 hours)  
 Port. 621. Portuguese Composition. (3 hours)  
 Port. 650. Brazilian Literature. (3 hours)  
 Port. 651. Contemporary Brazilian Literature. (3 hours)  
 Span. 520. Advanced Spanish Composition and Grammar. (2 hours)  
 Span. 556. Hispanic-American Poetry. (3 hours)  
 Span. 654. Spanish-American Novel: Beginnings. (2 hours)  
 Span. 655. Spanish-American Novel: Contemporary. (2 hours)  
 Span. 656. The Modernista Movement. (2 hours)  
 Span. 658. Hispanic-American Short Story. (2 hours)

**Latin-American Studies:**

- Latin-American Studies 690A,B. Interdisciplinary Seminar on Contemporary Latin-American Problems. (3 hours) Prerequisite: consent of instructor.

**Political Science:**

- Pol. Sci. 556. Modernization and Political Change in South America. (3 hours)  
 Pol. Sci. 557. Modernization and Political Change in Mexico and the Caribbean. (3 hours)  
 Pol. Sci. 578. International Relations in Latin America. (3 hours)

**Sociology:**

- Sociol. 571. Latin-American Social Change. (3 hours)  
 Sociol. 572. Rural Social Development in Latin America. (3 hours)  
 Sociol. 671. Problems in Latin-American Social Development. (2 hours)  
 Prerequisite: graduate status.

## Library and Information Sciences, Graduate Department of

**Associate Professors:** H. T. Johnson (director, 548 JRCL), Knight (assistant director, 548-G JRCL), Thorne, Wright.

**Assistant Professor:** Marchant.

The graduate programs offered by the Graduate Department of Library and Information Sciences provide professional training for the student wishing to obtain a Master of Library Science degree. Emphasis is upon a general preparation, but the large number of elective courses allows specialization in one of the following fields:

- The Public Library
- The Academic Library
- The School Library (IMC)
- The Scientific and Technical Library
- The Genealogical Research Library
- Information Science

Elements of these specialties appear throughout the entire curriculum in order to acquaint all students with the different aspects of librarianship. However, special courses require a student to specialize in one or more of the above and to choose work with children, young people, or adults.

Admission to the program is through the Graduate School. Graduation from an acceptable undergraduate program and a grade-point average of "B" (3.0) for the last two years of academic work are required.

The applicant may be required to take the Graduate Record Examination and submit the results before beginning the program. A personal interview is desired and may be required. Evidence of English proficiency may also be required. In some instances, special courses may have to be taken. Foreign students must submit the results of the TOEFL or USIS language examination with their application.

A reading knowledge of one modern foreign language is normally required, to be completed no later than the semester before applying for graduation. The native language of foreign students is not acceptable. Students who have not completed this requirement before entry into the program may apply for one of three options in lieu of a language. If an option is approved, no more than six hours of the option can be applied toward the degree. Where weaknesses in general education seem evident, the student may be required to take additional courses before beginning the program.

These options are as follows:

**Communications and Audiovisual.** Eleven to twelve hours of Commun. 201 or Sociol. 215, Commun. 535 or 610; Ed. 406, 506, 609, 610, 611; LIS 592.

**Computer Science.** Comput. Sci. 230, 331, 333, and LIS 654.

**Statistics.** Twelve hours of statistics or Stat. 501 and 502.

The language requirement can be fulfilled in the following ways:

1. By completing twelve semester hours.
2. By completing German, French, or Spanish 201, or higher number.
3. By completing the 95-96 series in German, French, or Spanish.
4. By passing the Education Testing Service examination.

The course work required for the specialties is below. In general, these requirements will be followed. If a student desires a substitution, permission must be obtained from his adviser before the substitute course is taken.

**The Public Library.** (36 hours) LIS 401; 413; 423; 527; 533; 539; two of 543, 545, and 547; 551; and 697R; electives from Ed. 340, 628; LIS 569, 662 or 579, 592, 628, 642 or 644; Commun. 535 or 610; Speech and Dram. Arts 527, Engl. 420 to total no less than 36 semester hours to be chosen in consultation with the student's adviser.

**The Academic Library.** (38 hours) LIS 401; 413; 423; 527; 533; 539; two of 543, 545, and 547; 553, and 697R; electives from 579, 628, 642, 644 or others to total no less than 38 semester hours, all to be chosen in consultation with the student's adviser.

**The School Library.** (36 hours) LIS 401; 413; 423; 429; 533; 539; two of 543, 545, and 547; 557; Ed. 340 or LIS 569; Ed. 406 and LIS 697R and electives from LIS 592, 642, 662 or others to total no less than 36 semester hours, all to be chosen in consultation with the student's adviser.

**The Scientific and Technical Library.** (38 hours) LIS 401; 413; 423; 527; 533; 539; 547; 555; 624; 697R and electives from 644, Comput. Sci. 331 or 333 or others to total no less than 38 semester hours, all to be chosen in consultation with the student's adviser.

**The Genealogical Research Library.** (36 hours) Experience or course work to equal an undergraduate minor in genealogy research; LIS 401; 413; 423; 527; 533; 539; two of 543, 545 and 547; 559 and 697R and electives from 579; 624; 628; 642; 644 or others to total no less than 36 semester hours, all to be chosen in consultation with the student's adviser.

**Information Science.** (41 hours) LIS 401; 413; 423; 527; 533; 539; 547; 551, 553, or 555; 579; 644; 654; 697; and Comput. Sci. 333, 351, and 451.

A student is expected to choose at least one specialty early in his graduate work, but in no cases later than the completion of sixteen hours. The specialty is chosen in consultation with the sponsor and a complete course outline is prepared. Copies of this outline remain with the department, the Graduate School, and the student, and, unless changed with department approval, constitute the mandatory program for the student. Later changes usually penalize the student by requiring additional courses. Depending upon the specialty chosen, thirty-six to forty-one graduate semester hours of credit are required to graduate.

Candidates are expected to maintain a grade-point average of "B." No thesis is required, but a comprehensive research project is to be completed by each student. Also a comprehensive final examination is required of all students before graduation. In two parts, written and oral, it covers both the area of general preparation and the area of specialization.

In addition to course work, attendance at a number of informal lectures without credit is required each semester of all students. These colloquia are intended to broaden the student's outlook on librarianship and related fields by presenting outstanding guest lecturers.

S. R. Shapiro, New York bookman, has established a gift of a \$100 U.S. Savings Bond to the outstanding graduate each year. This may be awarded as two \$50.00 bonds to two outstanding students.

#### Courses

- 401. Foundations of Library and Information Sciences.** (3:3:0) F.Su. Knight  
The basic principles and concepts underlying library and information sciences. Types of libraries, objectives, general organization. Required. To be taken first semester.
- 413. Selection and Acquisition of Materials.** (3:3:0) F.S.Su. Knight, Purdy  
Principles, criteria, and practice in evaluation, selection, and acquisition of book and nonbook materials. Required.
- 423. Reference Theory and Service.** (3:3:0) F.S.Su. Knight, Marchant, Purdy  
Intensive study of basic reference materials and services, including general bibliographic tools and form. Required.
- 429. Organizing Materials in the School Library—Media Center.** (3:3:0) F.S.Su.  
Thorne  
Classification and cataloging of materials in the instructional media center. Laboratory practice. Required of school library majors.
- 527. Organization and Processing of Materials.** (3:3:0) F.S.Su. Lamson, Wright  
Theory and principle of the documentation of book and nonbook materials as expressed through classification and cataloging. Laboratory practice. Required. School library majors should substitute LIS 429.
- 533. Library Organization and Administration.** (3:3:0) F. Prerequisite: LIS 401.  
Johnson, Marchant  
Organization and administration of libraries. Organizational and administrative theory discussed. Problems associated with personnel, authority, policy, planning, reports, standards, etc. Required.
- 539. Practicum in Librarianship.** (1:1:0) F.S.Su. Prerequisites: completion of or concurrent registration in LIS 401, 413, 423, and 429 or 527.  
Knight, Thorne  
Thirty hours of practice work under the supervision of a professional librarian. Required.
- 543. Literature of the Social Sciences.** (3:3:0) F. Purdy, Wright  
Analysis of subject concerns, methodology, and unique information needs of the various social science fields. Examination of literature resources and problems of bibliographic control.

- 545. Literature of the Humanities.** (3:3:0) F.Su. Purdy, Wright  
Analysis of subject concerns, methodology, and unique information needs of the various humanities fields. Examination of literature resources and problems of bibliographic control.
- 547. Literature of the Sciences.** (3:3:0) S.Su. Johnson, Lamson  
Analysis of subject concerns, methodology, and unique information needs of the various fields of science. Examination of literature resources and problems of bibliographic control.
- 551. The Public Library.** (2:2:0) S.Su. Prerequisite: LIS 533. Marchant  
Special problems in the public library. Strata of services, patterns of readers, special materials, organization, administration, standards, and public relations.
- 553. The Academic Library.** (2:2:0) S.Su. Prerequisite: LIS 533. Marchant, Nelson  
Special problems in college, university, and associated research libraries. Collection, staffing, users, organization, administration, and public relations.
- 555. Scientific and Technical Libraries.** (2:2:0) S.Su. Prerequisite: LIS 533. Johnson  
Special problems in scientific and technical libraries. Staffing, users, organization, administration, public relations, and handling of nonbook materials.
- 557. The Instructional Media Center in the School.** (2:2:0) F.Su. Prerequisite: LIS 533. Knight, Thorne  
The place of the IMC in the educational program. Standards, management, equipment, budget, and services.
- 559. The Genealogical Research Library.** (2:2:0) F.Su. Prerequisite: LIS 533. Schmidt  
Special problems in the administration of the genealogical research library.
- 569. Reading Guidance for Young People.** (2:2:0) F.Su. A. Jensen, Thorne  
A critical study of the reading interests and needs of young people. Problems of the reluctant and the avid reader. Extensive examination, discussion, and reading of books.
- 579. Patterns and Problems of Adult Readers.** (2:2:0) F.Su. Purdy  
Reading interests and habits of adults, survey of studies, materials for various types of readers, reader guidance, reader's advisory service, role of the library in adult education.
- 580R. Workshop: Current and Special Problems.** (1-2:1-2 weeks: 40-50 hrs. per week ea.)
- 592. Organizing Nonprint Materials in the Library.** (2:2:0) S.Su. Prerequisite: LIS 429. Thorne  
The organization and utilization of such materials as pictures, maps, tapes, recordings, film strips, etc.
- 614. Literature of Mormonism.** (2:2:0) F.Su. Purdy  
An intensive survey of the literature of Mormonism with emphasis upon the selection, organization, and utilization of this literature in libraries.
- 624. Government Publications.** (2:2:0) F.Su. Jordan, Lamson  
Intensive study of documents published by federal, state, and local governments, and the U.N. with attention to their selection, organization, and use in different types of libraries.
- 628. History and Theory of Written Communication.** (3:3:0) F.Su. Purdy, Wright  
Historical development of written communication and its interrelationships with the library in the context of the evolving social and cultural setting.

642. Seminar: Advanced Reference and Bibliography. (3:3:0) S.Su. Knight  
Types of bibliography, advanced bibliographic techniques, administrating reference services, analysis of research problems. The librarian-user interface.
644. Seminar: Advanced Cataloging and Classification. (3:3:0) S.Su. Lamson, Wright  
Examination of philosophical bases of classification and cataloging schemes. Extension of general descriptive cataloging, classification, and subject headings through use of L.C.
654. Seminar: Data Processing in Library and Information Sciences. (3:3:0) S. Johnson  
Survey of nonconventional and experimental methods and devices for cataloging, classifying, indexing, and retrieving; the use of data processing in all areas of librarianship.
662. Development of Libraries and Library Materials for Children. (3:3:0) S. Thorne  
Prerequisite: Ed. 340.  
Historical development of children's libraries, materials, and services. Publishers, illustrators, and authors are considered. Relationship to sociological, educational, and philosophical forces of various periods discussed.
664. Seminar: Philosophical Bases of Library and Information Sciences. (2:2:0) S. Johnson  
The social, ethical, logical, and epistemological bases of library and information sciences.
- 694R. Independent Research. (1-2:Arr.:0 ea.) F.S.Su.
- 697R. Research in Library and Information Sciences. (3:3:0 ea.) S.Su. Johnson, Lamson  
The bases, methods, and techniques of research. Experience in manipulating data. Statistical computer programs will be used and a research project completed under individual advisement. Required.
- The following courses may be used as electives; some may be required to complete areas of specialization.
- Communications 535. Public Relations. (3:3:0)
  - Computer Science 331. Computer Programming Language I (FORTRAN) (3:3:2)
  - Computer Science 333: Computer Programming Language II (COBOL). (3:3:2)
  - Computer Science 351. Information Structure. (3:3:1)
  - Computer Science 451. Information Systems Analysis. (3:3:2)
  - Education 340. Children's Literature. (2:2:0)
  - Education 406. Introduction to Production and Utilization of Instructional Media. (2:2:1)
  - Education 609. Selection and Utilization of Audiovisual Materials. (2:2:0)
  - Education 610. Designing and Producing Instructional Materials. (2:2:1)
  - Education 611. Administering Instructional Media. (2:2:0)
  - Education 628. Children's Literature. (2:2:0)
  - English 420. Literature for Adolescents. (2:2:0)
  - Humanities 201. The Arts in Western Culture: Age of Greece to Early Renaissance. (3:3:0)

- **Humanities 202. The Arts in Western Culture: Late Renaissance to the Modern Age.** (3:3:0)
- **Psychology 570. Computer Use in Behavioral Sciences.** (3:3:6)
- **Speech and Dram. Arts 527. Storytelling.** (2:2:0)
- **Statistics 501. Statistics for Research Workers I.** (5:4:3)
- **Statistics 502. Statistics for Research Workers II.** (5:4:3)

## Linguistics

**Associate Professor:** Blair (chairman, 239 MCKB).

(With its origin as an interdepartmental program, the linguistics program offers courses which are taught by faculty from several departments.)

### Requirements

It is expected that the graduate student in theoretical or applied linguistics will meet all the general requirements for advanced degrees as outlined by the Graduate School.

The following two programs are available in linguistics, one leading to a Master of Arts degree in theoretical linguistics, the other leading to a Master of Arts degree in applied linguistics.

#### Master of Arts Degree in Theoretical Linguistics

The prerequisites for admission to the M.A. program in theoretical linguistics are as follows: (1) Ling. 325 or Engl. 321, (2) Ling. 360, (3) Ling. 326, (4) intermediate-level competence in two foreign languages (201 or equivalent) or high-level competence in one foreign language (321 or equivalent). Provisional admission may be granted only on the recommendation of the linguistics program coordinator.

In addition to his thesis, an M.A. candidate in theoretical linguistics will be required to complete fourteen hours in Ling. 525, 527, 528, 693, and Engl. 529. A minimum of six additional hours may be selected from Ling. 529R; Engl. 621, 624; French 522, 692R; German 692R; Spanish 522, 692; or other approved courses.

#### Master of Arts Degree in Applied Linguistics

The prerequisites for admission to the M.A. program in applied linguistics are as follows: (1) Ling. 325 or Engl. 321, (2) Ling. 360, (3) Ling. 423, (4) intermediate-level competence in one foreign language (201 or equivalent), and (5) high-level competence in English if English is not the student's native language. Provisional admission may be granted only on the recommendation of the linguistics program coordinator.

In addition to his thesis, an M.A. candidate in applied linguistics will be required to complete fourteen hours in Ling. 527, 528 (or Engl. 529), 623, 693, and Engl. 577. A minimum of six additional hours may be selected from Ling. 525, 529 and other approved courses.

### Courses

- |  |       |
|--|-------|
| <b>525. Descriptive Phonology.</b> (3:3:0)           | Blair |
| <b>527. Descriptive Morphology.</b> (3:3:0)          | Blair |
| <b>528. Syntax.</b> (3:3:0) Prerequisite: Ling. 527. | Blair |

- 529R. Linguistic Structures.** (3:3:1 ea.) Blair  
**623. Problems in Contrastive Linguistics.** (3:3:0) Blair  
**693. Seminar in Linguistics.** (2:2:0) Blair  
Discussion of selected topics in linguistics.  
**699. Thesis for Master's Degree.** (1-6:Arr.:0)

## **Mathematics**

**Professors:** Fearnley, Fletcher, Hillam (chairman, 292 MSCB), Robinson, Yearout.

**Associate Professors:** Burton, Gee, Gill, Hansen, Higgins, Jamison, Larsen, Moore, Peterson, Skarda, Snow, Wickes.

**Assistant Professors:** Garner, Lamoreaux, Walker, Wight.

The Department of Mathematics offers courses leading to the degree of Master of Science in mathematics.

## **Master of Science in Mathematics**

This degree represents training in preparation (1) for additional study and research in mathematics at the Ph.D. level, (2) for employment in industry or government, (3) for teaching in junior colleges.

## Prerequisites

Before being admitted on a degree-seeking basis, a student must present credit at least equivalent to the current requirements for a B.S. degree in mathematics at Brigham Young University. In addition, his undergraduate preparation must include a year's sequence in abstract algebra and in advanced calculus.

## **Graduation Requirements**

A graduate student must meet the general Graduate School requirements. He may choose either Option I or Option II.

**Option I.** A candidate selecting this option is required to complete a minimum of eighteen semester hours in approved graduate mathematics and is also required to complete an acceptable thesis. In addition, at least nine semester hours in a minor field approved by the Department of Mathematics must be completed.

**Option II.** A candidate selecting this option is required to complete a minimum of twelve semester hours in approved graduate courses in one of the general areas: algebra, analysis, applied mathematics, or topology. In addition a minimum of twelve additional hours must be completed in courses selected from the remaining three areas, and an acceptable thesis must be presented.

All Master of Science candidates under either Option I or Option II must successfully complete a written examination covering both the graduate and undergraduate preparation in mathematics. This is normally administered during March and July.

The candidate's program must have prior approval from the department and must be filed with the graduate dean prior to registering for the last fifteen semester hours of credit applying toward the degree.

## Courses

- 332. Introduction to Complex Analysis.** (3:3:0) F.S.Su. Prerequisite: Math. 214 or 244.  
Complex algebra, analytic functions, integration in the complex plane, infinite series, theory of residues, conformal mapping.

- 371, 372. Abstract Algebra.** (3:3:0 ea.) F.S.Su. Prerequisite: Math. 142, 214, or 301.  
Preliminary examination of algebraic systems: groups, rings, fields, vector spaces, linear transformations, matrices, etc.
- 385. Linear Algebra.** (3:3:0) F.S.Su. Prerequisite: Math. 111.  
Vectors and matrices, linear equations, determinants, characteristic values, linear operators, quadratic forms, etc.
- 387. Theory of Numbers.** (3:3:0) F. Prerequisite: Math. 142 or 214.  
Foundations of number theory, congruences, residues, reciprocity law, Diophantine equations.
- 411. Numerical Methods.** (3:3:0) F.S. Prerequisites: Comput. Sci. 331 and Math. 244 or 321. Recommended: Math. 372 or 322 or 385.  
Interpolation, approximation, differentiation, integration, ordinary differential equations, and systems of equations, linear and nonlinear.
- 412. Introduction to Numerical Analysis.** (3:3:0) S. Prerequisite: Math. 411.  
Theory of constructive methods in mathematical analysis.
- 434. Introduction to Ordinary Differential Equations.** (3:3:0) F.S.Su. Prerequisites: Math. 244 or both Math. 214 and 385.  
First-order equations, linear equations, nonhomogenous equations, Laplace transforms, series solutions, matrices and linear systems.
- 436. Introduction to Partial Differential Equations.** (3:3:0) S. Prerequisites: Math. 434 or 321.  
Boundary value problems for the wave, heat, and Laplace equations, separation of variables method, eigenvalue problems, Fourier series, orthogonal systems.
- 451. Modern Geometry I.** (3:3:0) F. (m) Prerequisite: Math. 302 or 371.  
Synthetic and analytic projective geometry, including relationships with affine and Euclidean geometry. Geometry considered as the study of invariants of groups of transformations.
- 452. Modern Geometry II.** (3:3:0) S. Prerequisite: Math. 451.  
A continuation of Math. 451, including a relationship to linear algebra, supplemental design, and combinatorial mathematics.
- 501. Real Numbers.** (3:3:0) (Offered on demand)  
Extensive examination of various axiomatic descriptions of the real numbers and the interrelationships among these descriptions.
- 502. Set Theory.** (3:3:0) (Offered on demand)  
Zermelo-Fraenkel axioms for set theory, the axiom of choice, ordinal and cardinal numbers, the algebra of sets.
- 508. Mathematical Logic.** (3:3:0) F. Prerequisite: Math. 371 or 541.  
Propositional and first-order predicate calculi. Axiomatic set theory, well-ordering, transfinite induction.
- 513R. Advanced Topics in Applied Mathematics.** (3:3:0 ea.) (Offered on demand)  
Prerequisite: consent of instructor.  
Specialized topics selected from integral equations, Boolean algebra, information theory, group representations, calculus of variations, etc., varied from time to time.
- 541, 542. Introduction to Real Analysis.** (3:3:0 ea.) F.S. Prerequisite: Math. 214 or 244.  
Includes a rigorous treatment of continuity, differentiability and Riemann integration of functions of one and several real variables and a development of finite series.

- 551, 552. Introduction to Topology.** (3:3:0 ea.) F.S. Prerequisite: credit or concurrent registration in Math. 541.  
 Axiomatic treatment of linearly ordered spaces, metric spaces, arcs and Jordan curves, types of connectedness.
- 585. Matrix Analysis.** (3:3:0) (Offered on demand) Prerequisite: Math. 322, 372 or 385.  
 An introduction to matrix analysis, including the study of characteristic values, canonical forms, and functions of matrices, with applications.
- 629. Teaching Mathematics in Secondary Schools.** (3:3:0) (Offered on demand)  
 Contemporary materials, methods, and trends in mathematics instruction.
- 631, 632. Complex Analysis.** (3:3:0 ea.) (Offered 1970-71 and alternate years)  
 Prerequisites: Math. 332 and Math. 542.  
 Holomorphic functions, Cauchy integral theorems, Taylor and Laurent series, analytic continuation, conformal mapping, residue theory, and special topics.
- 634, 635. Theory of Ordinary Differential Equations.** (3:3:0 ea.) (Offered 1971-72 and alternate years) Prerequisites: Math 434 and 542.  
 Existence, uniqueness, and continuous dependence of solutions, linear systems, stability theory, plane autonomous systems, oscillation and comparison theorems, and eigenvalue problems.
- 641, 642. Functions of a Real Variable.** (3:3:0 ea.) (Offered 1971-72 and alternate years) Prerequisite: Math. 542.  
 Point sets, measures, measurable functions, Lebesques integration, Stieltjes integration, absolute continuity, and special topics.
- 643R. Special Topics in Analysis.** (3:3:0 ea.) F.S.Su. Prerequisites: Math 541, 542.  
 Topics selected from continued fractions, stochastic processes, generalized functions, etc.
- 645. Tensor Analysis.** (3:3:0) (Offered on demand) Prerequisite: Math. 244 or Math. 542.  
 Tensors, curves and surfaces in Euclidean spaces. Selected applications to relativity, elasticity theory, hydrodynamics, etc.
- 646. Differential Geometry.** (3:3:0) (Offered on demand) Prerequisite: Math. 645.  
 Tensors and differential forms, differential geometric theory of Euclidean and Riemannian spaces.
- 647, 648. Partial Differential Equations.** (3:3:0 ea.) (Offered 1970-71 and alternate years) Prerequisites: Math. 436 and 542.  
 General solutions, existence, uniqueness and stability of standard equations, transforms, separable coordinate systems, special techniques, numerical solutions.
- 651, 652. General Topology.** (3:3:0 ea.) Prerequisite: Math. 552 or consent of instructor.
- 653R. Special Topics in Geometry.** (3:3:0 ea.) F.S.Su. Prerequisites: Math. 452 and 372.  
 Topics from n-dimensional projective and algebraic geometry, foundations, transformations, curves and surfaces, forms and sheaf theory.
- 655R. Special Topics in Topology.** (3:3:0 ea.) (Offered on demand) Prerequisite: consent of instructor.  
 Special topics selected from geometric combinatorial topology, differential topology, Euclidean topology, algebraic topology, Knot theory, homotopy theory, dimension theory, fixed-point theory, manifold theory, etc., varying from time to time.
- 661, 662. Functional Analysis.** (3:3:0 ea.) (Offered on demand) Prerequisites: consent of instructor; Math. 642 or 632.
- 671, 672. Modern Algebra.** (3:3:0 ea.) Prerequisite: Math 372.

- 675R. Special Topics in Algebra.** (3:3:0 ea.) F.S.Su. Prerequisite: Math 671.  
Group theory, commutative algebra, homological algebra, ring theory, algebraic number theory.
- 681, 682. Linear Algebra.** (3:3:0 ea.) (Offered on demand) Prerequisites: Math. 671.
- 695. Readings in Mathematics.** (1-2:1-2:0) (Offered on demand)
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Microbiology

**Professors:** Beck, Donaldson (graduate coordinator, 875 WIDB), Larsen (chairman, 775 WIDB), Sagers.

**Associate Professors:** Bradshaw, Burton, Hoskisson, Jensen, North, Wright.

### Requirements

Adequate preparation for graduate work in the Department of Microbiology presupposes satisfactory training in the physical and biological sciences. If a student is deficient in foundation courses, opportunity will be given after entering Graduate School to correct these deficiencies; however, such a student will not be able to receive the advanced degrees in the minimum time required of more qualified candidates.

### Master's Degree

In addition to the general Graduate School requirements, a student must complete the following courses or equivalents for a Master of Science degree in microbiology: Microbiology 331, 501, 511, 531, 551, 581, 699; one year of inorganic college chemistry; one semester of quantitative analysis; Chemistry 351, 352, 354, 581, 584; one year of college physics; and Mathematics 111. Many of these course work requirements would normally be met during a student's undergraduate training.

### Doctor of Philosophy Degree

Prior to selection of a dissertation subject and assignment to a research adviser, the student must pass a written qualifying examination in the following areas: (a) general microbiology, (b) pathogenic microbiology, (c) immunology, (d) virology, (e) bacterial physiology, and (f) microbial genetics. This examination will normally be given after one year of graduate study. It may be waived if the student has received the master's degree in microbiology. After satisfactory completion of the qualifying examination or the master's requirements the student will be assigned a permanent advisory committee, the chairman of which will be his major research adviser. The courses and number of credit hours required for the Ph.D. degree will be determined by the advisory committee based upon the level of previous academic preparation of the student and his specific interests.

A student must pass a comprehensive written and oral examination prior to admission to candidacy for the Ph.D. degree. This examination will be taken not earlier than two semesters after completion of the qualifying examination. Prior to admission to the comprehensive examination the student must have satisfied the language requirements and completed courses in differential and integral calculus, physical chemistry, and Micro. 641 and 661.

### Courses

- 501. Pathogenic Microbiology.** (5:3:6) F.S. (m) Prerequisite: Micro. 331 or consent of instructor.  
A study of the characteristics of pathogenic bacteria, viruses, rickettsia, yeasts, and molds.

- 511. Immunology.** (4:2:6) F.S. (m) Prerequisite: Micro. 501 or consent of instructor.  
Theories of immunity; training in serological methods.
- 521. \*Industrial Microbiology.** (2:2:0) F. (m) Prerequisites: Micro. 331 and biochemistry.  
The employment of microorganisms in industrial processes.
- 522. \*Industrial Microbiology Laboratory.** (1:0:3) F. (m) Prerequisite: completion of or concurrent registration in Micro. 521.
- 531. Virology.** (4:2:6) S. (m) Prerequisite: Micro. 501 or 511.  
Characteristics of viruses and virus diseases.
- 551. Advanced Microbiology.** (5:3:6) S. (m) Prerequisites: Chem. 581, 584 or consent of instructor.
- 581. History of Microbiology.** (1:1:0) F. (m) Prerequisite: senior or graduate status.
- 611. \*Advanced Immunology.** (2:2:0) S. Prerequisite: Micro. 511.
- 631. Advanced Virology.** (2:2:0) Prerequisites: Micro. 531; Chem. 581 or equivalent.  
Replication and biophysical characteristics of cytocidal and oncogenic animal viruses with emphasis on the molecular basis for the attendant changes in cell metabolism.
- 632. Cell and Tissue Culture Techniques.** (2:0:4) Prerequisites: Micro. 531; Chem. 581 or equivalent.  
A laboratory course in advanced techniques utilized in cell and tissue culture procedures.
- 641. Radioactive Tracer Techniques in Biology.** (3:1:6) F. (m) Prerequisites: Physics 202; consent of instructor.
- 651. Special Topics in Bacterial Metabolism.** (2:2:0) F.
- 661. \*Microbial Genetics.** (4:2:6) F. Prerequisites: Micro. 331; a course in general genetics; Chem. 581 or equivalent.  
A study of the molecular bases of genetics of bacteria and bacteriophages, including mechanisms of DNA transfer, uptake, recombination, replication, and mutation.
- 691R. Graduate Seminar.** (1:1:0 ea.) F.S.
- 695R. Research.** (1-5:Arr.:Arr. ea.) F.S.  
Instruction and laboratory experimentation in specific microbial disciplines.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.
- 799. Dissertation for the Ph.D. Degree.** (Arr.) F.S.

\*Offered alternate years only.

## Music

**Professors:** Davis, Earl (graduate coordinator, E-556 HFAC), Goodman (chairman, C-550 D HFAC), Halliday, H. Laycock, Nibley, Nordgren, Sardoni, Woodward.

**Associate Professors:** Barnes, Bradshaw (composer-in-residence), Keeler, R. Laycock, Mason, Stubbs, Williams.

**Assistant Professors:** Belnap, Foxley, Gibbons, Longhurst, Manookin, Randall.

The Department of Music offers graduate programs leading to the Master of Music, Master of Arts, and Doctor of Philosophy degrees. The master's degrees

are in preparation for (1) further study and research at the doctoral level; (2) teaching and/or supervision at the elementary, secondary, junior college levels, and in private studios; (3) performance and composition; (4) background in the many related fields such as community recreation, therapy, church music, merchandising, broadcasting, and music criticism. The doctoral degree is in preparation for administration; junior college, college, university, or conservatory teaching; research; or composition.

Full graduate standing is granted to students who

1. Meet the general regulations as outlined by the Graduate School.
2. Possess the baccalaureate degree with a major in music.
3. Have at least a "B" average in the last two years of college work.
4. Pass the Music Department graduate entrance examination **prior to registration**. This examination (which presupposes the information and skills of Music 292, 484, 485, or their equivalents) is normally given each semester on the day preceding registration (excluding Sunday). Individuals may apply for it on any school day or workday before this time, however, by contacting TESTING, B-238 ASB. A student may not take graduate classes in which the examination shows him deficient until such deficiencies have been made up. Required classes to remove deficiencies in background must be taken for credit and may not be audited.
5. Pass the entrance audition before the faculty of the major performance area. Only students who wish to either major or minor in applied music need to take this audition. Former BYU students who were presented in an approved BYU senior recital for the Bachelor of Arts degree with a major in applied music are excused from this audition.

Candidates for an advanced degree in music education (elementary or secondary) must have completed the general certification requirements or equivalent. Students wishing to take an advanced degree with a major in music theory should possess a baccalaureate degree with a major in music theory or its equivalent. Candidates for an advanced degree in musicology should possess a baccalaureate degree with a major in music theory or its equivalent and must possess a reading knowledge of at least one foreign language, preferably French or German. Candidates for an advanced degree in applied music should possess a baccalaureate degree in applied music or its equivalent and (majors and minors) must register for Music 660Rp during each semester in residence.

Provisional standing may be recommended for a student who has not completed the above general requirements or the specific requirements listed below. Deficiencies in background must be made up, moreover, before full standing will be recommended.

#### Master of Arts Degree

The basic requirements for the master's degree in music are the same as the general Graduate School requirements. Both Option I and Option II (see pages 38-39) are available. Approved fields for study are music education, music theory,\* musicology, and applied music (available as a minor field only). Special minimum departmental requirements for the master's degree are as follows:

**Music Education:** Mus. 605, 610, 612, 613, 635, 693, and 699.

**Music Theory:** Mus. 613, 635, 686, 693, and 698 or 699.

**Musicology:** Mus. 613, 635, 637, 638, 639, 675, 693, and 699.

\*A student who has had substantial experience in composition may, with permission of the Music Department graduate faculty, submit a major composition to fulfill the thesis requirement for the Master of Arts degree.

#### Master of Music Degree

For qualified students whose interests lie principally in performance, the Department of Music offers a program leading to the Master of Music degree

in piano, voice, or organ, and orchestral instruments. The course work is supervised by the advisory committee. Required courses are:

**Performance: 10-14 hours.**

Mus. 660Rp.

Mus. 566, 567 (four hours beyond bachelor's degree program).

Mus. 697R (Recital).

**Research: 7 hours.**

Mus. 635.

Mus. 693.

Mus. 697R (Paper).

**Other: 6 hours.**

Mus. 613.

Mus. 639.

**Electives: 5-9 hours.**

A minimum of thirty-two hours is required for the degree.

The courses in performance and research culminate in the public recital (Mus. 697R) and the research paper.

Before the recital and no later than the beginning of the final semester, the candidate will appear before his committee and pass a repertoire examination in which he will demonstrate the depth of his knowledge of the literature for his instrument. At this time, the candidate will propose the program and date of the recital and the subject of the research paper, which will have been chosen by the student in conjunction with his applied instructor.

The research paper will discuss in a scholarly manner specific aspects of the recital literature. At least three weeks in advance of the recital, the candidate is required to defend his paper before a jury of graduate faculty members from his major area of study. The approved research paper will be filed with the Graduate School in the same manner as a thesis.

The candidate will be presented in a recital no later than thirty days before graduation. A jury of three faculty members will attend the recital and pass upon its acceptance. A recital fee of \$25 is required which pays for printed programs and recording of the recital, a tape of which is given to the student.

**Doctor of Philosophy Degree\***

The doctoral program in music is flexible and is designed to meet each candidate's needs. It offers optional emphasis in the areas of music education, music theory, and musicology. The Ph.D. curriculum in music includes a total of eighty-six to eighty-eight hours of approved course work and research beyond the baccalaureate degree as follows:

1. A core program\* of at least twenty-eight semester hours of advanced study in music which provides the framework and basic techniques for systematic learning and research in any area of music. This core consists of the following courses: Mus. 605, 613, 635, 637, 638, 639, 675, 754, 785.
2. A major area of emphasis (music education, music theory, or musicology) of at least thirty-six hours to be prescribed by the advisory committee, but which will include Mus. 693, 699 (or equivalent), 794 (six hours), and the writing of an acceptable dissertation based on original research (Mus. 799, eighteen hours' credit). Mus. 686 is also required for students whose emphasis is in music theory.
3. A minor of at least thirteen semester hours which may be in any area of emphasis within the Music Department or in any other department of the University.

\*The Doctor of Education degree, under the College of Education, is also offered with a minor in music education.

A student desiring to pursue the Ph.D. program must take the Graduate Record Examination (music supplement only) and pass the departmental graduate entrance examination prior to the first registration. During the first semester of work following the master's degree or by the time he has accumulated approximately forty-five semester hours beyond the baccalaureate degree, he must pass the departmental doctoral admission examination.

### Courses

- 537. Music for Elementary School Teachers.** (2:2:0) Prerequisites: Mus. 226, 337 or experience as an elementary classroom teacher. Davis  
Experience in teaching various music activities in the elementary school.
- 565. Piano Pedagogy.** (2:2:0) S. Prerequisite: advanced standing as a pianist. Methods, materials, and problems in teaching piano. Keeler
- 566A,B; 567A,B. Applied Music Literature.** (2:2:0 ea.) F.S.Su. Prerequisite: senior standing as an applied music major. Belnap, Keeler, Pollei, Woodward  
Intensive study of literature for the major instrument. Taken by senior and graduate students in applied music, with separate sections for voice, piano, and organ.
- 568. Vocal Pedagogy.** (2:2:0) S.Su. Prerequisites: advanced ability as a singer, Mus. 165, 166. Curtis, Halliday
- 569. Organ Pedagogy.** (2:2:0) S. Prerequisite: Mus. 468. Keeler
- 587, 588. Composition.** (3:3:0 ea.) F.S.Su. Prerequisite: Mus. 292. Bradshaw
- 601. Music in the Elementary School.** (2:2:0) F.Su. Prerequisites: Mus. 337 and the equivalent of an elementary education teaching minor in music. Davis, Groesbeck
- 603. Music in the Junior High School.** (2:2:0) S.Su. Prerequisite: Mus. 601. Davis
- 605. Influence of Music on Behavior.** (3:3:0) F.Su. Prerequisite: general psychology, sociology, or equivalent. Goodman, Mason
- 610. Supervision and Administration of Music in the Public Schools.** (2:2:0) S. Su. Goodman, Mason
- 612. Music Education in Society.** (3:3:0) S.Su. Prerequisites: Mus. 484, 485, or equivalent. Davis, Goodman
- 613. Basic Concepts in Music Education.** (2:2:0) F.Su. Davis, Goodman  
Required of all candidates for graduate music degrees.
- 615. Vocal Methods, Materials, and Resources.** (2:2:0) F.Su. Prerequisite: Mus. 479 or equivalent. Halliday, Woodward
- 616. Instrumental Methods, Materials, and Resources.** (2:2:0) S.Su. Prerequisite: Mus. 479 or equivalent. Goodman
- 620. Advanced Instrumental Conducting.** (2:3:3) F.Su. Prerequisites: Mus. 292, 374, 375, 485, or equivalent. R. Laycock, Sardoni
- 621. Advanced Choral Conducting.** (2:3:3) S.Su. Prerequisites: Mus. 166, 292, 364, 374, 375, 485, or equivalent. Halliday, R. Woodward
- 625. Summer Music Clinic.** (2:4:4) (Two weeks during clinic) Su.  
May be counted as either music education or applied music.
- 630A,B,C. Special Lectures in Music Education.** (2:2:0 ea.)
- 635. Musical Research Techniques.** (3:3:0) F.Su. Prerequisite: graduate standing or consent of instructor. Barnes, Earl  
Required of all candidates for graduate music degrees during or before the first fall semester of graduate work.

- 637. Medieval and Renaissance Music.** (4:4:0) F.Su. Prerequisites: Mus. 484 and 485, or equivalent. Barnes, Cannon
- 638. Music of the Baroque Period.** (3:3:0) S.Su. Prerequisites: Mus. 484, 485, or equivalent. Barnes
- 639. Classic and Romantic Music.** (4:4:0) F.Su. Prerequisites: Mus. 484, 485, or equivalent. Barnes
- 641. Special Lectures in Musicology.** (2:2:0) F.S.Su. Prerequisites: Mus. 484, 485, or equivalent.
- 648R. Collegium Musicum.** (1:0:3 ea.) F.S. Prerequisite: consent of director. Practical experience in designing programs, outlining music, and preparing notes of music from the medieval to modern times.
- 652. History of Notation and Paleography.** (3:3:0) F. (Offered 1971-72 and alternate years) Prerequisites: 484, 485, 637, or equivalent. Barnes
- 656. Hymnology.** (2:2:0) S. Prerequisites: Music 484, 485 or equivalent. Barnes, Earl
- 660Rp. Graduate Applied Instruction.** (2:1:0 ea.) F.S.Su. Prerequisites: completion of undergraduate applied proficiency requirements and audition. Fifteen 45-minute lessons per semester. Two to three hours' practice required per day.
- 663. Solo Recital.** (2:1:0) F.S.Su. Prerequisite: permission of graduate applied faculty. Williams Required of all graduate students minoring in applied music. One period per week with private teachers, 2-3 hours of practice per day, plus public performance of the recital. Special fee.
- 673. Advanced Problems in Musical Structure.** (3:3:0) F.Su. Prerequisites: Mus. 472, 491. Bradshaw, Manookin
- 675. Music of the Contemporary Period.** (3:3:0) S.Su. Prerequisites: Mus. 484, 485. Bradshaw, Manookin
- 686. Pedagogy of the Music Theory.** (3:3:0) F.Su. Prerequisite: Mus. 292. Nordgren
- 687, 688. Composition.** (3:3:0 ea.) F.S.Su. Prerequisite: Mus. 588 or equivalent. Bradshaw
- 693. Proseminar in Music.** (2:2:0) S.Su. Prerequisites: Mus. 484, 485 and 635, or equivalent, and approval of advisory committee. Barnes, Davis, Earl, H. Laycock, Mason Required of all candidates for graduate music degrees.
- 694A,B. Independent Readings.** (2:0:6 ea.) F.S.Su. Prerequisite: Mus. 693 or equivalent.
- 697R. Recital for Master of Music Degree.** (4:Arr.:Arr. ea.) Prerequisite: approval of advisory committee and graduate music faculty. Belnap, Bradshaw, Halliday, Keeeler, Pollei, Smith, Williams, Woodward Required of all candidates for the Master of Music degree with a major in applied music. As part of the course requirement the candidate is expected to present to a committee of the graduate faculty a scholarly paper related to the recital literature. Special fee.
- 698. Composition for Master's Degree.** (2-6:Arr.:Arr.) F.S.Su. Prerequisite: approval of the Music Department graduate committee based upon evidence of ability in composition as manifested in a preliminary work. Bradshaw To be submitted in lieu of a thesis by candidates for the master's degree majoring in composition.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. Prerequisite: approval of Music Department graduate committee. Candidates for the master's degree are required to show competence in writing and research before work is begun on the thesis.

- 753. Advanced Problems in Notation.** (3:3:0) S. (Offered 1971-72 and alternate years) Prerequisite: Mus. 652. Barnes
- 754. History of Musical Instruments.** (3:3:0) F. (Offered 1971-72 and alternate years) Prerequisites: Mus. 484, 485, or equivalent. Williams
- 785. Historical Aspects of Music Theory.** (3:3:0) S.Su. (Offered 1971-72 and alternate years) Prerequisite: Mus. 292. Nordgren
- 794A,B,C,D. Seminar in Music.** (3:3:0 ea.) F.S. Prerequisites: Mus. 635, 693, or equivalent, and approval of graduate advisory committee. Barnes, Davis, Earl, H. Laycock
- 799. Dissertation for the Ph.D. Degree.** (Arr.) F.S.Su. Prerequisite: approval of the Music Department graduate committee.

## Philosophy

**Professors:** Madsen, Riddle, Yarn.

**Associate Professor:** Warner (chairman, 436 JRCL).

**Assistant Professors:** Garrard, Rasmussen, Reynolds.

A graduate minor in philosophy may be obtained by following a course of study and class work as approved by the person representing philosophy on the student's advisory committee. A minimum of nine hours of course work including at least one seminar will be required on the master's level. A minimum of fifteen hours of course work including at least two seminars will be required on the doctoral level. The normal prerequisite for a graduate minor in this area is an undergraduate minor in philosophy.

No major is offered in philosophy.

### Courses

- 311. Philosophy of Language.** (2:2:0) F.S. (m)  
Traditional and contemporary theories of meaning and truth and their bearing on philosophical issues.
- 312. Philosophy of Mind.** (2:2:0) F.S. (m)  
The concept of mind and brain and their relationship; the self and self-knowledge; action and free agency.
- 316. Philosophy of Science.** (3:3:0) F.S.Su. (m) Prerequisite: Phil. 110.  
Recommended: Phil. 101.  
The conceptual foundations of modern science.
- 321. History of Ancient and Medieval Philosophy.** (4:4:0) F.S.Su. Prerequisite: Phil. 110.  
Major systems of thought in the Western tradition from the sixth century B.C. to the fourteenth century A.D.
- 322. History of Modern Philosophy.** (4:4:0) F.S.Su. Prerequisite: Phil. 110.  
Major systems of thought in the Western tradition from the fifteenth century to the nineteenth century.
- 323. Contemporary Anglo-American Philosophy.** (3:3:0) F.S.Su. Prerequisite: Phil. 110.  
Pragmatism, positivism, and various linguistic approaches to philosophical problems.
- 324. Contemporary Continental Philosophy.** (3:3:0 ea.) F.S.Su. Prerequisite: Phil. 110.  
Existentialism, phenomenology, and Marxism.
- 413R. Topics in Ethics and Value Theory.** (2:2:0 ea.) F.S.Su.  
Intensive study of selected issues in ethics, aesthetics, or theory of value.

- 421R. Topics in Ancient Philosophy.** (2:2:0 ea.) F.S.Su. Recommended: Phil. 321.  
Intensive study of a selected figure, theme, or movement in the ancient period.
- 422R. Topics in Medieval Philosophy.** (2:2:0 ea.) F.S.Su. Recommended: Phil. 321.  
Intensive study of a selected figure, theme, or movement in the medieval period.
- 423R. Topics in Modern Philosophy.** (2:2:0 ea.) Recommended: Phil. 322.  
Intensive study of a selected figure, theme, or movement in the modern period through the nineteenth century.
- 424R. Topics in Contemporary Philosophy.** (2:2:0 ea.) F.S.Su.  
Intensive study of a selected figure, theme, or movement in the twentieth century.
- 448R. Readings in Philosophy.** (1-4:1-4:0 ea.) F.S.Su.
- Mathematics 508. Mathematical Logic.** (3:3:0)
- 515. Seminar in the Philosophy of Religion.** (2:2:0) F.S.Su.
- 516. Seminar in the Philosophy of Science.** (2:2:0) F.S.Su.
- 530. Seminar in Philosophical Analysis.** (2:2:0) F.S.Su.  
Intensive application of philosophical method.
- 648R. Readings in Philosophy.** (1-4:1-4:0 ea.) F.S.Su.

## Physical Education

**Professors:** Allsen, Bangerter, Hart, Hartvigsen, Holbrook, C. Jensen, Kimball, Roundy (chairman, 270 SFH).

**Associate Professors:** Call, Jarman, Johnson, Watts.

**Assistant Professors:** Fisher, Jones.

### Degrees

The Department of Physical Education offers work leading toward the Master of Arts, Master of Science, and the Doctor of Education degrees.

#### The Master of Arts Degree

The Master of Arts degree is awarded to those involved with artistic creativity, philosophical and historical methods, and evaluative studies.

The field of physical education calls upon varying skills and abilities. The breadth of the field calls for individuals to serve in varying capacities. They develop individual, school or community projects. They employ artistic and creative methods; they plan events and exert leadership; and they pursue historical, philosophical, interpretive, and evaluative studies. According to the interest and the aptitude of the student, he thus selects either a project or a thesis in partial fulfillment of the requirements for the Master of Arts degree.

**Project:** The project is an application of practical research, artistic performance, creative endeavor, or effective planning and leadership. The student works with his advisory committee, gaining all approvals, and providing final reports which parallel the thesis both in form and in quality.

**Thesis:** The research is conducted and reported in the approved manner and thesis form.

#### The Master of Science Degree

The Master of Science degree is awarded to those concerned with scientific method in observational or controlled experimental study and research in

which prediction, relationships, verification, and the orderly processes of science are pursued. The field of physical education recognizes the contributions of those who do research in physiology, movement, kinesiology, and "sports medicine." These areas are concerned with scientific method consisting of primary emphasis on controlled observation, experimentation, quantification, verification, prediction, and the rational ordering of facts and principles resulting from such pursuits.

**Thesis:** The research is conducted and reported in the approved manner and thesis form.

#### General Requirements for Master's Degree

The student must satisfy the following requirements:

1. Meet all basic general requirements for the master's degree as outlined by the Graduate School.
2. Receive official acceptance by the department chairman.
3. Have completed the baccalaureate degree with a major in physical education or its equivalent. All major undergraduate courses, as required at Brigham Young University, or their equivalency, are to be satisfied before the candidate will be accepted on a degree-seeking basis.
4. P.E. 692, Research Methods in Physical Education, is required of all master's degree students. All students who plan to use an experimental design in their research must complete P.E. 635 or demonstrate proficiency in statistical design.
5. Complete a minimum of thirty semester hours of credit in a combination of major and minor or a major with supporting fields. A suggested apportionment of the credit is indicated:

<b>Major-Minor</b>	<b>Major and Supporting Fields</b>
15 hours major	18 hours major
9 hours minor	6 hours two supporting fields
6 hours thesis or project and electives	6 hours thesis or project and electives
<hr/> <b>30 Total</b>	<hr/> <b>30 Total</b>

6. Submit a thesis or project done under the direction of a committee composed of representatives from the major and minor fields. The thesis or project format must conform with standards for written work as recommended by the Graduate School.
7. Perform satisfactorily in a final oral examination on the thesis or project and the professional subject matter area.

The responsibility of knowing and fulfilling Graduate School and department regulations and requirements for the master's degree rests with the student.

#### The Doctor of Education Degree

Through the Education Area, qualified students may major in physical education and minor in an appropriate related field and be awarded the Ed.D. degree. For information relating to the Ed.D. degree in physical education, contact Donald D. Shaw, coordinator of graduate studies in physical education.

#### A. Admission

Fulfill all requirements for admission to the Graduate School. In addition, meet the following departmental requirements:

1. Submit evidence of at least two years of successful professional experience and an adequate background in the intended areas of specialization. In physical education, this involves knowledges and competencies equivalent to those required in the undergraduate major program at Brigham Young University. A complete analysis of the academic background of each student will be made to determine any deficiencies. Those deficiencies detected must be corrected by the individual prior to acceptance.

2. Take the graduate tests before arriving on campus. The graduate tests administered by the BYU Testing Division and the applicant's GPA will be used to determine provisional admission to the graduate program.
3. Take a three-semester-hour seminar for all first-semester doctoral students. The seminar will be conducted by four team-teaching faculty members representing the four subdivisions of the graduate department. Various tests and examinations in English, writing, reporting, etc., will be conducted; personal interviews will be conducted. Various faculty members will be involved in group discussions, and various other programs will be conducted in the seminar in order to determine the degree of capability of the doctoral students. At the end of the semester the seminar faculty team will make a recommendation to the area faculty, who will then accept or reject the admission of the candidiate.

#### B. Course Work

A minimum of seventy-five semester hours of credit beyond the baccalaureate degree is required. Any course included in the seventy-five hours should strengthen the professional preparation of the student. These seventy-five semester hours are divided into four general areas:

1. Graduate Education Core Courses Required of All Students (15 semester hours):

These courses must be selected by the candidate, subject to the approval of the committee.

2. Physical Education Core Courses Required of All Students (25 semester hours):

- P.E. 547 (2) Advanced Corrective Physical Education
- P.E. 601 (2) Problems in Physical Education
- P.E. 610 (2) Philosophy of Physical Education
- P.E. 640 (2) Curriculum Construction in Physical Education
- P.E. 642 (2) Mechanical Analysis of Activities
- P.E. 645 (2) Functional Anatomy and Kinesiology
- P.E. 646 (2) Laboratory Method and Procedures
- P.E. 647 (2) Advanced Physiology of Exercise
- P.E. 648 (2) Theory of Motor Learning
- P.E. 662 (3) Administrative and Public Relations
- P.E. 670 (3) History of Physical Education
- P.E. 692 (2) Research Methods in Physical Education

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3. Minor Area: (10-14 hours)

Each candidate shall select an appropriate related minor area of 10-14 hours from any field where a graduate minor is offered, subject to the approval of the candidate's advisory committee.

4. Elective Area: (21 or more hours) Twelve of these hours must be in physical education; the other hours may be in a subject area approved by the advisory committee.

- P.E. 631 (2) Problems in Athletic Conditioning
- P.E. 633 (2) Physical Education for the Mentally Retarded
- P.E. 635 (2) Research Design of Physical Education
- P.E. 663 (2) Planning Facilities
- P.E. 673 (3) Physical Education in the Elementary School
- P.E. 694 (2) Individual Study
- P.E. 780 (2) Professional Preparation
- P.E. 797R (2-6) Individual Research in Physical Education

#### C. Competency in Statistics

All candidates must demonstrate competency in statistics of at least the level demanded by P.E. 635. This competency must be demonstrated in a written examination or by completing this course with a grade of "B" or better.

#### D. Examinations

At the completion of the course work a written examination will be given to determine areas where the candidate may be weak. If the student does not pass the examination he will then register for one of two seminars in his major area of interest, for the purpose of "filling in the gaps" in his field and completing his work in his major. It is believed that this seminar work might be done concurrently with the beginning work on the student's prospectus and field study.

The student must complete a dissertation which embodies results of original research and is judged by his committee to be suitable in whole or in part for publication in a professional journal. At a final oral examination the student must present and define his dissertation.

The equivalent of one full year is to be devoted to original research culminating with the dissertation. Credit for Physical Education 799, Dissertation for the Ed.D. Degree (12 hours), is given on the recommendation of the advisory committee.

#### F. Coordination of Candidates between the Departments of Physical Education and the Education Area

1. Applications received by the Office of the Graduate Dean will be forwarded to the graduate coordinator in the College of Physical Education.
2. The applications are forwarded by the graduate coordinator to the department chairman for review by a Department Admissions and Standards Committee to determine the applicant's qualifications for doctoral work.
3. The department chairman's recommendation of the applicant's fitness for doctoral work is forwarded to the graduate coordinator, who presents it to the Education Area for approval. Applicants are notified in writing regarding their status.

#### Courses

- 547. Advanced Corrective Physical Education.** (2:2:1) Prerequisite: P.E. 446. Call
- 575. Materials and Methods for Secondary Teachers.** (2:1:2) F. Hirst
- 601. Problems in Physical Education.** (2:3:0) F. Bangerter
- 610. Philosophy of Physical Education.** (2:2:0) F. Holbrook  
Interpretations, beliefs, and concepts underlying the profession of physical education.
- 631. Problems in Athletic Conditioning.** (2:2:0) F. Jensen  
Application of scientific principles to problems in athletic conditioning.
- 633. Physical Education for the Mentally Retarded.** (2:2:0) F. Prerequisite: bachelor's degree in physical education. Call  
Theory, concepts, and programs in physical education for trainable and educable mentally retarded.
- 635. Research Design in Physical Education.** (2:2:1) F. Prerequisites: P.E. 462 and 464 or equivalent. Roundy  
Experimental designs commonly used in physical education.
- 640. Curriculum Construction in Physical Education.** (2:2:0) S. Hart  
Curriculum problems for elementary, secondary, and college physical education programs.
- 642. Mechanical Analysis of Activities.** (2:2:0) S. Johnson  
Analysis of the mechanics of movement in various activities to develop the highest degree of skill.
- 645. Functional Anatomy and Kinesiology.** (2:2:0) S. Prerequisites: Zool. 105, 261, 262, 561; P.E. 341, 344, 446, 449, or equivalent. Call  
Functional applied anatomy and kinesiology for physical education students.

646. Advanced Physiology of Activity Laboratory. (2:2:0) F.Su. Prerequisite: concurrent enrollment in P.E. 647. Fisher
647. Advanced Physiology of Activity. (2:2:0) S. Prerequisites: Zool. 105, 261, 262, 561; P.E. 341, 344, 446, 449, or equivalent. Fisher  
Physiology of strength of the musculoskeletal system and endurance of the cardiovascular system.
648. Theory of Motor Learning. (2:2:0) S.Su.
662. Administration and Public Relations. (3:3:0) F.S.Su. Hartvigsen  
Administrative and public relations problems at all school levels: local, state, and national.
663. Planning Facilities. (2:2:0) S. Kimball  
Basic planning for facilities for school and community physical education and recreation programs.
670. History of Physical Education. (3:3:0) S. Holbrook
673. Physical Education in the Elementary School. (2-3:3:0) Su. Holbrook  
For the teacher, the principal, and the supervisor. Emphasis on objectives, interrelationships with the curriculum, and the content material used in accomplishing educational results.
- 674A,B,C. Workshop in Physical Education in the Elementary Schools. (1:comb. of 40 hrs. ea.) (Offered on demand) Jacobson  
Materials, methods, and teaching progressions in physical education for the elementary school.
690. Seminar. (2:2:0) F.S.Su. Prerequisite: provisional admission to Ed.D. program.
692. Research Methods in Physical Education. (2:2:0) F.Su. Roundy
694. Individual Study. (2:1:1) F.S.Su. Kimball  
Readings from recently published professional literature.
696. Seminar in Problems. (1:1:0) Su.
698. Field Project, Master's Degree. (1-6:0:Arr.) F.S.Su. Holbrook, Roundy
699. Thesis for Master's Degree. (6-9:Arr.:Arr.) F.S.Su. Holbrook, Roundy
780. Professional Preparation. (2:2:0) Su. Prerequisites: completion of graduate courses, and experience in college instruction and teacher education.
- 797R. Individual Research in Physical Education. (2-6:Arr.:Arr. ea.) F.S.Su. Prerequisite: undergraduate major in physical education; matriculation for graduate study in the department.
799. Dissertation for the Ed.D. Degree. (12:Arr.:Arr.)

## Physics and Astronomy

**Professors:** Ballif, Barnett, Decker, Dibble, Dixon, Dudley, Eastmond, Fletcher (emeritus), A. Gardner (graduate coordinator, 185 ESC), J. Gardner (chairman, 296 ESC), Hales (emeritus), A. Hill, M. Hill, McNamara, Nelson, Vanfleet.

**Associate Professors:** Hansen, Harrison, Jensen, Jones, Larson, Palmer.

**Assistant Professors:** Evenson, Hatch, Mason, Strong, Woodford.

The Department of Physics and Astronomy offers the degrees of Master of Science, Master of Arts, and Doctor of Philosophy. The Master of Science degree generally is taken by those who intend to continue on for the Ph.D. degree, but

it also serves as a terminal degree for many who intend to go into industrial or governmental research or into teaching. The Master of Arts degree is intended primarily for prospective secondary and junior college teachers. The Ph.D. degree is awarded for a high degree of scholarly achievement in the subject matter of physics and in research. It is not granted simply upon completion of certain routine requirements. General requirements for these degrees are outlined by the Graduate School. Following are special requirements relating to the Department of Physics and Astronomy.

The submission of both aptitude and advanced physics scores from the ETS Graduate Record Examination are required of foreign student applicants and recommended for students graduating from colleges in the U.S. Entering graduate students on Ph.D. and M.S. programs are expected to take a comprehensive written proficiency examination on undergraduate physics before the end of the first week after registration. This examination will cover mechanics, electricity and magnetism, modern physics, thermal physics, and optics.

### Master of Science Degree

The basic requirements for the master's degree in physics are the same as the general Graduate School requirements. This degree may be taken with a minor (Option I) or without a minor (Option II). A recommended minor is mathematical physics, which may be satisfied with Physics 517, 518, and 621.

A student seeking only a master's degree with the intent of going into research or development work would find the courses listed in item B-2 under the Ph.D. requirements to be profitable. However, he may find it to his advantage to substitute some more specialized courses or some undergraduate courses where this can be done in conformity with the regulations of the Graduate School.

### Master of Arts Degree

Students who plan to teach in the secondary school system or in junior colleges should consider the M.A. degree. This degree is usually taken under Option I, but may be taken under Option II.

One very efficient program leading to the M.A. degree in physics is called the MA-3 program for secondary and junior college teachers. This three-year program begins in the junior year and leads to both a B.A. and M.A. degree in physics as well as teacher certification. The program is outlined below. If the student is interested only in junior college teaching, the program can be considerably simplified by the elimination of the physical science and teacher education courses and the addition of Ed. 640, 642, and 644 for the graduate minor.

**Prerequisites:** Math. 111, 112; general education requirements outside of the physical sciences and mathematics.

<b>Junior Year</b>	<b>F</b>	<b>S</b>	<b>Su</b>	<b>Graduate Year</b>	<b>F</b>	<b>S</b>	<b>Su</b>
	Math. 113, 214, 434	4	3		Ed. 403, 415	4	2
Ed. 301B		2		Health 362			2
Physics 211, 213, 214	5		5	Religion			
Phys. Sci. 377		3					
Religion	2	2	2				
Math. 301, 302, 371	3	3	3				
Chem. 105			4				
	—	—	—				
	16	16	12				
<b>Senior Year</b>	<b>F</b>	<b>S</b>	<b>Su</b>	Physics 318	3	3	
Physics 222, 316, 300	4		3	Physics 551, 552	3	3	
Physics 341	3			Two-semester			
Physics 321	4			physics series	3	3	
Physics 386	1			Minor	3	6	
Phys. Sci. 479		8		Physics 699 (Thesis)			6
Physics 317, 511	3		3		—	—	
Ed. 310			2		12	12	6

**Suggested Minors:**  
Math. 387, 501, 502; Ed. 640, 642, 644.

**Doctor of Philosophy Degree**

It is expected that the student will meet the general requirements of the Graduate School for advanced degrees. The following special requirements relate to a degree in physics or in physics and astronomy. These requirements automatically satisfy the major and minor requirements of the Graduate School:

**A. Admission to Degree-Seeking Status**

Study leading to the Ph.D. degree in physics is contingent upon admission to the Graduate School. It is expected that the student shall have satisfactorily completed the following courses or their equivalents: Physics 121, 122, 221, 222, 317, 318, 321, 322, 341, 342, 431, 471, 551, 552 and Math. 214, 434. A student may remove any deficiencies by special examination or by registering for any of these courses at the outset of his graduate studies and earning "A" or "B" grades in them. Credit so earned may not be applied toward meeting the requirements for the Ph.D. degree.

**B. Course Work**

1. A minimum of forty-eight hours in approved formal course work exclusive of graduate seminars, and eighteen hours of Physics 799.
2. The following courses or their equivalents with grade of "A" or "B":
  - a. Mathematical Physics (Physics 517, 518).
  - b. Quantum Mechanics (Physics 651, 652).
  - c. Dynamics (Physics 621) or Celestial Mechanics (Physics 521, 522).
  - d. Mathematical Theory of Electricity and Magnetism (Physics 641, 642) (physics degree), or Introduction to Astrophysics (Physics 527, 528) (physics and astronomy degree).
3. At least twelve credit hours in that field listed below which is most closely related to the field of the student's research to constitute a major and twelve credit hours in a second field to constitute a minor. No duplication between these courses and those in B-2 is permitted. A student selecting nuclear physics or solid state physics as his major field must select theoretical physics as his minor field. The student whose research is in acoustics or biophysics may, with the approval of his committee, construct a twelve-hour major or minor which includes courses outside the department. Students who desire the degree in physics and astronomy must elect b and i.
  - a. Acoustics. Courses which will satisfy this requirement are Physics 561, 562, 565, 566, 623, 631, 681.
  - b. Astrophysics. Courses which will satisfy this requirement are Physics 527, 528, 611, 612, 627, 628, 671.
  - c. Atomic Physics and Spectroscopy. Courses which will satisfy this requirement are Physics 671, 672, with additional courses selected from 527, 528, 631, 632 and, depending upon content, 711.
  - d. Nuclear Physics. Courses which will satisfy this requirement are Physics 655, 656, with additional courses selected from 555, 681, 751, 752, and depending upon content, 711.
  - e. Plasma Physics. Courses which will satisfy this requirement are Physics 645, 646, with additional courses selected from 536, 537, 623, 631, 632.
  - f. Solid State Physics. Courses which will satisfy this requirement are Physics 623, 631, 681, 682 and, depending upon content, 711.
  - g. Theoretical Physics. Courses which will satisfy this requirement are Physics 617, 618, 625, 632, 751, 752.
  - h. Planetary and Space Physics. Courses which will satisfy this requirement are Physics 536, 537, with additional courses selected from 645, 646, 671, 672 and, depending upon content, 711.
  - i. Physics group for physics and astronomy degree only: six hours selected from Physics 631, 632, 641, 642 and six hours selected from Physics 536, 537, 645, 646, 655, 656 and, depending on content, 711.

4. Graduate seminar, for which the student may receive four hours' credit.

#### C. Language

Physics students may fulfill the language requirement under option II-D as described under the general University requirements for the Ph.D. degree. If this option is selected the student must present "B" grades or better in E.E. 307. (Digital Computer Techniques) and six (6) hours selected from Physics 617, 618, Math. 371, 411, 412, 647, 648. (These courses must be in addition to courses used to fulfill the requirements in B-3.) Other courses approved by the student's committee, the department chairman, and the graduate dean may be added to this list.

#### D. Comprehensive Examinations

Before the student is admitted to candidacy for the Ph.D. degree, he must pass a series of written examinations covering the courses in item B-2 and an oral examination covering the two general fields selected under item B-3. Normally these examinations will be taken toward the end of the second year. The written examinations will be given within four weeks after registration in the fall and within four weeks after registration in the spring. A student is permitted two attempts to pass the group of four written examinations. If the first attempt does not result in the successful completion of at least two of the four examinations, then all four are to be taken again on the second attempt.

#### E. Acceptance for Research

Before admission to candidacy, the student must be tentatively accepted as a research student by a member of the faculty of the Department of Physics and Astronomy. The student may become acquainted with research opportunities available by attendance at seminars and lectures, discussions with faculty and graduate students, etc.

#### F. Admission to Candidacy

The student is admitted to candidacy after (1) completing two years of graduate study, (2) passing the language examinations, (3) passing the comprehensive examinations, and (4) obtaining approval of a subject for the dissertation.

#### G. Dissertation

The student must present a written dissertation embodying the results of original research judged by his committee to be suitable in whole or in part for publication in a professional journal.

#### H. Defense of Dissertation

The student must give an oral presentation and defense of the dissertation before his committee and others designated by his committee.

#### I. Fields Presently Available for Original Research

Acoustics	Physics of the Solid State
Astro-Geophysics	High-pressure phenomena
Astronomy	Low-temperature phenomenon
Astrophysics	Magnetic resonance
Space and planetary physics	Microwave spectroscopy
Biophysics	Plasma Physics
Nuclear and Particle Physics	Spectroscopy
Fundamental atomic constants	Theoretical Physics
Nuclear structure	

#### Courses

300. **Philosophical Foundations of Modern Physics.** (3:3:0) F.S.Su. Prerequisite: college-level course in chemistry or physics, or consent of instructor.  
Nielsen

Selected topics of modern physics (e.g., relativity and quantum mechanics) will be briefly developed and examined for their philosophical implications. Some current challenging problems will be explored.

**Successful completion of Math. 113 or Math. 243 and Physics 221 or their equivalents is prerequisite to all courses above 310.**

- 316. Atomic and Nuclear Physics Laboratory.** (1:0:3) F.S.Su. Prerequisite: completion of or concurrent registration in Physics 222. M. Hill, Miller  
Required of all physics majors. Experimental work in particle and radiation physics.
- 317, 318. Elementary Methods in Theoretical Physics.** (3:3:0 ea.) F.S.  
Development of formal procedures in theoretical physics including the application of linear algebra, vector analysis, complex analysis, and the techniques of Fourier, et al., to the classical equations of physics.
- 321, 322. Mechanics.** (4:4:0 ea.) F.S. Prerequisite: Physics 317.  
Methods of classical mechanics applied to equilibrium, particle motion, central forces, small oscillations, conservation principles, and rigid body dynamics, with an introduction to Lagrange's equations.
- 341, 342. Electricity and Magnetism.** (3:3:0 ea.) F.S. Prerequisite: Physics 317.  
Classical theory of electricity and magnetism developed from its experimental foundations. Electrostatics, magnetostatics, currents and their associated fields, circuit theory, Maxwell's equations.
- 386. Advanced Experimental Techniques.** (1:1:2) F.S. Eastmond  
Basic techniques in electrical, optical, thermal, electronics, etc., measurements and instrumentation for contemporary experimental physics.
- 387. Advanced Physics Laboratory.** (2:1:3) F.S. Prerequisite: Physics 386 or equivalent. Eastmond  
Application of contemporary methods and instruments to the experimental observation and measurement of physical phenomena.
- 391, 392. Seminar in Current Physics.** (1:1:0 ea.) F.S. Prerequisite: consent of instructor.  
For junior physics majors enrolled in the Honors Program.
- 431. Thermal Physics.** (3:3:0) F. Larson  
Fundamental principles of thermodynamics with introduction to the concepts of kinetic theory and statistical mechanics for physicists, chemists, and engineers.
- 441. Electronics for Physicists.** (5:3:6) S. Prerequisite: Physics 342. Jones  
Fundamental concepts of electronics and basic circuitry with emphasis on the tools needed for specialized research in a variety of fields of physics.
- 471. Optics and Electromagnetic Theory.** (3:3:0) S. Eastmond  
The nature and propagation of light, including reflection, refraction, coherence, and interference, treated from the point of view of electromagnetic theory; introduction to quantum optics.
- 497A,B,C. Introduction to Research.** (1-3:0:2-6 ea.)
- 511. Introduction to Theoretical Physics.** (3:3:0) Su. Prerequisite: Math. 434.  
Introduction to basic principles of physics with emphasis on their mathematical formulation. Topics treated vary from year to year.
- 513A,B,C,D. Special Topics in Contemporary Physics.** (1-3:1-3:0 ea.) Prerequisite: consent of instructor.  
Course content and scheduling varies from year to year. Subject matter will usually be related to recent developments in physics.
- 517, 518. Mathematical Physics.** (3:3:0 ea.) F.S. Prerequisite: Physics 318 or equivalent. Recommended: Math. 542.  
Topics in modern theoretical physics including applications of matrix and tensor analysis and linear differential and integral operators.

- 521, 522. **Celestial Mechanics.** (3:3:0 ea.) F.S. Prerequisite: consent of instructor.  
Fundamental principles of celestial mechanics and orbital computations. Hansen
- 527, 528. **Introduction to Astrophysics.** (3:3:0 ea.) F.S. Prerequisite: consent of instructor.  
Fundamental principles and observational techniques of astrophysics. McNamara
- 536, 537. **Space and Planetary Physics.** (3:3:0 ea.) F.S. (Offered on sufficient demand) Prerequisite: consent of instructor. Ballif, Jones  
Topics will include solar physics, the interplanetary environment, and the atmospheres and magnetism of the earth and other planets.
551. **Elements of Quantum Theory.** (3:3:0) F. Prerequisites: Physics 222 and Math. 434 or equivalents.  
Basic course in modern theory of radiation and particle physics for physicists, chemists and engineers. Topics include special relativity, quantum mechanics with spectroscopic applications, quantum statistics, and solids.
552. **The Atomic Nucleus.** (3:3:0) S. Prerequisites: Physics 222; Math. 434; or equivalents. Dixon  
Basic course in nuclear physics for physicists, chemists, and engineers. Topics include description of nuclear properties, scattering theory, nuclear reactions, and elementary theory of the nucleus.
555. **Nuclear Reactor Physics.** (3:3:0) F. Prerequisite: Ch.E. 582 or consent of instructor.  
Introduction to neutron physics in multiplying and nonmultiplying media; diffusion and slowing down of neutrons; multigroup reactor theory.
557. **Nuclear Reactor Physics Laboratory.** (1:1:2) S. Prerequisite: Physics 555.  
Laboratory experiments in neutron and nuclear reactor physics; reactor operation, neutron flux, cross section, neutron age and diffusion parameter measurements.
561. **Fundamentals of Acoustics.** (4:4:0) F. Strong  
General consideration of the generation, transmission, and reception of sound. Discussion of vibrating systems, properties of elastic media, mechanical and electrical energy, and radiation.
562. **Acoustical Measurements.** (2:0:4) F. Prerequisite: completion of or concurrent registration in Physics 561.  
Selected experiments in acoustics.
565. **Characteristics of Speech.** (3:3:0) S. (Offered on sufficient demand) Prerequisite: Physics 561 or consent of instructor. Strong  
Acoustical theory of speech production. Auditory capabilities of man and speech perception. Techniques for analysis and synthesis of speech. Synthesis-by-rule and machine recognition.
566. **Musical Acoustics.** (3:3:0) S. (Offered on sufficient demand) Prerequisite: Physics 561 or consent of instructor. Strong  
Technical study of acoustical behavior and timbre of musical instruments. Ensemble and choral effects. Mathematical models of instruments. Analysis and synthesis of instrumental tones. Electronic musical instruments.
581. **Introduction to X-Ray Diffraction Analysis.** (3:2:3) F. (Offered on sufficient demand) Prerequisite: consent of instructor. Barnett  
Introduction to the theory and experimental techniques of X-ray diffraction, including an introduction to crystal geometry.
582. **X-Ray Crystallography.** (3:2:3) S. (Offered on sufficient demand) Prerequisite: Physics 581 or equivalent. Barnett  
Introduction to X-ray crystallography with emphasis on the space groups, and structure-dominated crystal physics.

- 611, 612. **Astrophysics.** (3:3:0 ea.) F.S. (Offered on sufficient demand) Prerequisite: consent of instructor. McNamara  
The theory of stellar atmospheres and interstellar matter.
- 617, 618. **Advanced Topics in Theoretical Physics.** (3:3:0 ea.) F.S. (Offered on sufficient demand)  
Topics include current developments in the formal theoretical basis of modern physics.
621. **Dynamics.** (3:3:0) F. Prerequisite: Physics 322.  
Advanced treatment of classical mechanics, including Lagrange's and Hamilton's equations, rigid body motion, and canonical transformations.
623. **Dynamics of Continuous Media.** (3:3:0) S. (Offered on sufficient demand)  
Prerequisite: Physics 621.  
The mechanics of systems with an infinite number of degrees of freedom. Topics include elasticity and hydrodynamics.
625. **Theory of Relativity.** (3:3:0) S. (Offered on sufficient demand) Prerequisite: Physics 621. Harrison  
Brief description of special relativity; introduction to general relativity and gravitation with applications to cosmology.
- 627, 628. **Advanced Topics in Astrophysics.** (3:3:0 ea.) F.S. (Offered on sufficient demand) Prerequisite: consent of instructor. McNamara  
Internal structure of stars; galactic structure.
- 631, 632. **Statistical Mechanics.** (3:3:0 ea.) F.S. Larson  
Advanced thermodynamics; classical statistical mechanics, quantum statistics, transport theory.
- 641, 642. **Mathematical Theory of Electricity and Magnetism.** (3:3:0 ea.) F.S. Hatch  
Prerequisite: Physics 342.  
Advanced electrostatics and magnetostatics; Maxwell's equations and electromagnetic waves; relativistic electrodynamics, radiation theory, interaction of matter with electromagnetic fields.
- 645, 646. **Plasma Physics.** (3:3:0 ea.) F.S. (Offered on sufficient demand) Prerequisites: Physics 431, 621, and 642. A. Gardner  
A study of the plasma state of matter, including a description both in terms of individual particles and in terms of a fluid, with applications.
- 651, 652. **Quantum Mechanics.** (3:3:0 ea.) F.S. Prerequisites: Physics 518, 551. Decker, J. Gardner  
Nonrelativistic quantum mechanics logically developed with applications.
- 655, 656. **Nuclear Physics.** (3:3:0 ea.) (Offered on sufficient demand) Prerequisite: Physics 552. Dixon, Jensen  
Fundamental properties of nuclei, nuclear forces, nuclear models, electromagnetic properties of nuclei, radioactivity, nuclear reactions, and interaction of radiation with matter.
671. **Atomic and Molecular Spectroscopy.** (3:3:0) F. (Offered on sufficient demand) Prerequisite: consent of instructor. Eastmond  
Series and multiplet atomic spectra and rotational, vibrational and electronic band spectra; determination of atomic and molecular structure.
672. **Observation and Analysis of Spectra.** (3:1:4) S. (Offered on sufficient demand) Prerequisite: Physics 671 or consent of instructor. Eastmond  
Analysis of optical spectra with instrumentation and experimentation including stellar spectroscopic techniques.
- 681, 682. **Modern Theory of Solid State.** (3:3:0 ea.) F.S. Prerequisites: Physics 431 and 551. Vanfleet  
An introductory course for students in physics, chemistry, and engineering. Physical properties of atomic and molecular systems which are arranged in a regular periodic structure.

**691, 692. Seminar.** (1:1:0 ea.) F.S.

**697R. Research.** (Arr. ea.)

**699. Research and Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**711A,B,C. Advanced Topics in Physics.** (1-3:1-3:0 ea.) F.S. Prerequisite: consent of instructor.

Course content varies from year to year. Special topics in theoretical and experimental physics are treated.

**751, 752. Advanced Quantum Theory.** (3.3:0 ea.) F.S. (Offered on sufficient demand) Prerequisite: Physics 652.

Topics in relativistic quantum mechanics including quantum field theory.

**791, 792. Seminar.** (1:1:0 ea.) F.S.

**797R. Research.** (Arr. ea.)

**799. Research and Dissertation for Ph.D. Degree.** (Arr.)

## Political Science

**Distinguished Professor:** Grow.

**Professors:** Hickman, Hillam (chairman, 270 MSRB), Mabey, Melville, Reeder.

**Associate Professors:** Farnsworth, Midgley, Morrell, Slover, Snow, Taylor.

**Assistant Professors:** Buckwalter (graduate coordinator, 430 MSRB), Tullis.

The Department of Political Science offers programs of study leading to the Master of Arts degree.

### Requirements for Majors

The requirements for admission to graduate study and for completion of the M.A. degree in political science are the general requirements of the Graduate School and the specific requirements indicated below.

To be admitted to M.A. degree applicant status in the department, a student is required (1) to have achieved satisfactorily in his overall undergraduate study as evidenced by a GPA of 3.0 or above for the last sixty semester credits; (2) to have had, as a minimum, the equivalent of eighteen semester credits of introductory and upper-division political science courses, including political philosophy; (3) to submit results of the Graduate Records Examination, including the advanced test in political science; and (4) to have clearly demonstrated the personal and academic maturity sufficient to give promise of successfully completing the master's program. A student who is deficient in requirements 1, 2, or 3 but is nevertheless admitted, will be a provisional graduate student while making up the deficiencies.

As early as possible prior to the initial graduate registration, each student must contact the graduate coordinator about a graduate committee. The student then sets up an individual program in consultation with his graduate committee of two faculty members, one in the field in which he will write his thesis and one in a supporting field (the latter will be from another department only if a full minor is taken).

The M.A. program consists of a minimum of thirty-one credit hours. Students are required to take the following: Pol. Sci. 501, 502 and 508 (or have taken the undergraduate equivalents); 645R for two semesters; two seminars; and six credits of 699 for the thesis. Preparation of the political science fields for the master's examination should be broader than the courses and seminars taken. It may be well to include in the last semester of the program Pol. Sci. 698R in which a systematic review is made of the literature in the fields.

The following fields of concentration are available within political science:

Political Theory and Philosophy  
American Political Systems

Comparative Political Systems  
International Politics

The distribution of fields depends upon the individual career needs of the student, as indicated below:

A student expecting to continue graduate study beyond the M.A. must concentrate his study in political science in two of the above fields if he takes no courses outside the department, or one of the above if he takes a related field or fields in one or more other departments (the latter training should be reflected in the thesis).

A dual major in political science and area or other specialized graduate study programs, such as the Latin-American and Asian programs, is required to take 508 and concentrate in one field in political science, in addition to the requirements of the area program (not more than nine credits of which may be counted toward the total of thirty-one), and to write a thesis relevant to political science as well as the area program.

A student desiring the junior college certification should distribute his study in the American, comparative, and international fields, with heavier concentration in one for the thesis. (He need not take 508.) He will also need a minor totaling twenty credit hours of undergraduate and graduate study, not more than nine of which may be counted toward the thirty-one credit hours. The minor should be reflected in the thesis. The certification itself consists of courses in education (640, 642 and 644), which must be taken in addition to the thirty-one credit hours. For details see an adviser in the Education Area.

Although there is no formal language requirement for the M.A. in political science, language proficiency is expected if research for the thesis is contemplated on a non-English speaking political system. Those taking a dual major in an area study program will be expected to satisfy the relevant language requirement. Furthermore, those expecting to continue toward the Ph.D. should become aware of the language and statistics requirements at the universities where they may wish to study. If they are deficient in these requirements they should add this training to their graduate program.

**Note:** Because graduate faculty members are often not on campus during the summer terms, it is highly recommended that each student plan his M.A. program so that it may be completed during the Fall or Spring Semester.

#### Requirements for Those Taking Political Science as a Minor or Related Field

In selecting political science courses and seminars as part of their program, graduate students majoring in other departments may take any offering for which they have the prerequisites. If a political science graduate faculty member serves as a minor member of a student's graduate committee, it is expected that the thesis topic will have some political relevance.

#### Courses

310. **The United States Political System.** (3:3:0) F.S.Su. Prerequisite: Pol. Sci. 110.  
Buckwalter, Grow, Melville  
Systematic inquiry into the national government and politics of the U.S. in the context of American society as a whole; emphasizes roles, interest patterns, bases of power and policy formulation, implementation and appeal.
311. **State and Local Government and Politics.** (3:3:0) F.S.Su. Prerequisite: Pol. Sci. 110.  
Grow, Williams  
Relation of state and national governments, forms of state governments and politics; types of municipal governments and their development and operation.

**330. Introduction to Public Administration.** (3:3:0) F.S.Su.

Grow, Slover, Snow, Williams, Wright

Organization and operation of government. Relationship of administration to other branches of government; types of control over administration; central and local government.

**350. Political Systems of the USSR and Eastern Europe.** (3:3:0) F.S.Su.

Recommended: Pol. Sci. 150 or Hist. 330 or 331. Mabey, Morrell

The Communist Party and Soviet government; Marxist-Leninist ideology; deciding and implementation of policy; political impact upon society and the economy.

**355. Political Systems of United Kingdom and Commonwealth.** (3:3:0) F.S.

Recommended: Pol. Sci. 150. Mabey

Development of the British Constitution; examination of growth of cabinet government; the Crown, Parliament, Civil Service; local and governmental administration; English judicial system; the Commonwealth.

**359. Modernization and Political Change.** (3:3:0) F.S. (m) Recommended: Pol. Sci. 150. Tullis

Analytical and comparative approach to the nature and causes of political change and stability in Asia, Middle East, Africa, and Latin America.

**360. Constitutional Law of the U.S. I.** (3:3:0) F.S. (m) Reeder, Williams

American federal system.

**361. Constitutional Law of the U.S. II.** (3:3:0) F.S. (m) Reeder, Williams

Fundamental rights and immunities.

**370. Theory of International Relations.** (3:3:0) F.S.Su. (m) Prerequisite: Pol. Sci. 170. Recommended: Pol. Sci. 300. Hillam

Theoretical approach to the international system and the interactions between regional and national systems; basic concepts of conflict and cooperation.

**371. Contemporary U.S. Foreign Relations.** (3:3:0) F.S. (m) Recommended: Pol. Sci. 110. Buckwalter, Hickman

Emergence of the United States as the world power and its impact upon the other major powers and representative smaller countries.

**375. International Organizations.** (3:3:0) F.S. (m) Prerequisite: Pol. Sci. 170. Recommended: Pol. Sci. 300. Taylor

Survey of process of international organizations in historical and political perspective.

**380. World Communism.** (3:3:0) F.S. (m) Morrell

Emergence and development of Communist politics in relation to Marxist and Fabian socialism, fascism, anticolonialism, and Western democracy.

 **History 384. U.S. Diplomatic History.** (3:3:0) (m) Melville **History 385. American Constitutional History.** (3:3:0) (m) Melville**402. Introduction to Political Philosophy.** (3:3:0) F.S.Su. (m) Midgley, Sorensen

Recommended: Phil. 110 or other experience in philosophy.

General historical introduction to the major expressions of political philosophy.

**423. Minority Group Politics in America.** (3:3:0) F.S. (m) Tullis

Changing role of minority groups in contemporary American politics. Sources of political cleavage and patterns of conflict resolution.

**457. Government and History of Canada.** (3:3:0) S. (m) Grow

Growth and development of Canada and the operation of her government.

- 501. Ancient Political Philosophy.** (3:3:0) F. (m) Midgley, Sorensen  
 The history of political philosophy, beginning with the pre-Socratics and ending with Hobbes. (For graduate and undergraduate students who are emphasizing the field of political philosophy or are intending to do graduate study in political science.)
- 502. Modern Political Philosophy.** (3:3:0) S. (m) Midgley, Sorensen  
 The history of political philosophy beginning with Hobbes and ending with the recent revival of political philosophy. (For graduate and undergraduate students as explained under Pol. Sci. 501.)
- 503. Contemporary Political Philosophy.** (3:3:0) (m) Midgley, Sorensen  
 Survey of the attack upon political philosophy by political theorists, and the various attempts to revive it by philosophers and theologians.
- 504. The Logic of Political Inquiry.** (3:3:0) F.S. (m) Sorensen  
 Analyzes comparatively the logic of scientific and normative inquiry and the logical structure of the products of such inquiry.
- 506. American Political Thought.** (3:3:0) S. (m) Melville  
 American political and legal ideas from the colonial period to the present, with an analysis of their influence upon development of American history and government.
- 508. Empirical Political Theory.** (3:3:0) F. Buckwalter  
 Background, development, and critique of empirical theories about systems, functionalism, elites, etc., in the political process.
- 510. Parties and Pressure Groups in the U.S.** (3:3:0) F.S.Su. (m) Prerequisite: Pol. Sci. 110. Grow  
 Organization and methods of action of American political parties and pressure groups.
- 514. The United States Presidency.** (3:3:0) F.S.Su. (m) Melville  
 The American president and vice-president, White House Office, Bureau of the Budget, Cabinet, and National Security Council examined in political as well as governmental aspects.
- 520. American Legislative Systems.** (3:3:0) F.S.Su. (m) Prerequisite: Pol. Sci. 110. Buckwalter  
 Structure and organization of Congress and state legislative bodies; nature of business transacted and conflict resolution; influences acting upon such bodies; parliamentary procedures.
- 523. Intergovernmental Relations in the United States.** (3:3:0) S. (m) Prerequisites: Pol. Sci. 310 and 311.  
 Federal-state-local and interstate relations, adjustment and change in our federal system. A survey of major programs and trends; emphasis on organizational, administrative, and fiscal relationships.
- 525. The Military in Government and Politics.** (3:3:0) (m) Prerequisites: Pol. Sci. 310 and 370. Slover  
 Role of defense agencies in government; strategic alternatives for defense which affect politics, economics, and foreign relations; and role of the military in assisting governing of nations abroad.
- 530. Quantitative Analysis in Public Administration.** (3:3:0) Recommended: Pol. Sci. 330. Wright  
 Research in decision making: design, tools, and techniques for gathering data, and statistical analysis.
- 532. Public Personnel Administration.** (3:3:0) F. (m) Prerequisite: Pol. Sci. 330. Grow, Williams  
 Treatment of processes, procedures, controls, and problems of personnel administration in the public service.

- 533. Public Finance Administration.** (3:3:0) F. (m) Prerequisite: Pol. Sci. 330.  
Harlow, Snow, Wright  
Public financial organization, revenue sources and administration, administrative aspects of budgetary planning and control, and intergovernmental financial relationship.
- 534. State Government and Administration.** (3:3:0) F. (m) Prerequisite: Pol. Sci. 330.  
Snow, Williams  
Problems and issues in state government administration; the changing role of state government; organizational and administrative innovations to meet new and changing demands.
- 535. Municipal Administration.** (3:3:0) S. (m) Recommended: Pol. Sci. 330.  
Grow, Harlow  
The functions and environment of the municipal administrator.
- 536. City Planning.** (3:3:0) S. (m) Recommended: Pol. Sci. 330.  
Basic problems and techniques involved in city planning.
- 537R. Program Administration.** (3:3:0 ea.) F. (m) Recommended: Pol. Sci. 330.  
Government institutions and their programs. Basic factors underlying effective administration in specific functional areas of public administration.
- 538. International Project Administration.** (3:3:0) (m) Recommended: Pol. Sci. 359.  
Slover, Snow  
The administration of United States programs abroad. Problems faced, living conditions, techniques of administration, approaches to education, etc.
- 539. Comparative Public Administration.** (3:3:0) S. (m) Recommended: Pol. Sci. 359.  
Wright  
Comparative analysis of various administrative procedures and practices.
- 540. Public Management Control Systems.** (3:3:0) F.S. Recommended: Pol. Sci. 330.  
Uses of organizational, budgetary, and electronic information systems for public management control and coordination.
- 550. Political Systems of France and Germany.** (3:3:0) F.S. (m) Mabey, Morrell  
Emphasis on the contemporary political systems of France and West Germany; comparisons with Switzerland, East Germany, and Scandinavia.
- 551. Political System of China.** (3:3:0) F.S.Su. (m) Recommended: Pol. Sci. 150 or Hist. 343 or 344.  
Farnsworth  
Comparative analysis of the Communist Chinese political system within the context of the total social system.
- 552. Political System of Japan.** (3:3:0) F.S.Su. (m) Recommended: Pol. Sci. 150 or Hist. 345 or 346.  
Farnsworth  
Comparative analysis of the Japanese political system within the context of the total social system.
- 553. Political Systems of the Middle East.** (3:3:0) F. (m)  
Analysis of governmental institutions of the Middle East with emphasis on the structure and dynamics of modern Middle Eastern politics.
- 556. Modernization and Political Change in South America.** (3:3:0) S. (m)  
Recommended: 359 or consent of instructor. Tullis  
Analytical and comparative approach to the relation of economic development and political change, and the impact of social forces on political order.
- 557. Modernization and Political Change in Mexico and the Caribbean.** (3:3:0) S. (m) Recommended: Pol. Sci. 150, 359 or equivalent. Tullis  
Analytical and comparative approach to the relation of economic development and political change, and the impact of social forces on political order.

558. **Modernization and Political Change in Asia.** (3:3:0) S. (m) Recommended: Pol. Sci. 150 and/or 359. Farnsworth, Hillam Analysis of selected political systems of Asia (excluding China and Japan), utilizing developmental and comparative methodology.
563. **Administrative Law of the U.S.** (3:3:0) F. (m) Reeder Legal setting for administrative bodies and judicial control of administrative action. Cases in administrative law read and discussed.
564. **Jurisprudence.** (3:3:0) F. (m) Midgley, Reeder Problem approach to ancient and modern legal philosophies, with special attention given to nature of justice and the relation of law to morality.
568. **Anglo-American Legal Institutions.** (3:3:0) S. (m) Melville, Reeder Origins and development of common law and equity, the writ system, court systems, basic legal terms, and the anatomy of a lawsuit.
570. **Formulation of American Foreign Policy.** (3:3:0) F.S. (m) Hickman The structure and function of American national government and politics relating to the formulating of foreign policy.
572. **USSR Foreign Relations.** (3:3:0) F.S. (m) Recommended: Pol. Sci. 170, 350, 370 or Hist. 330 or 331. Morrell Development of Soviet Russia's foreign relations under the Bolsheviks, Comintern, etc., but especially its relations since 1945 with major areas of the world; the policies, their formulation and implementation.
573. **International Relations of Western Europe.** (3:3:0) F.S. (m) Hickman Study of the transitional role of Western Europe in world politics with emphasis upon integration and defense.
575. **International Law.** (5:5:0) S. (m) Reeder Nature and function of international law; recognition, succession, jurisdiction rights, and immunities of states; nationality and jurisdiction over nations.
576. **Regional International Systems.** (3:3:0) F.S. (m) Taylor Analysis and comparison of selected regional international systems; regional defense, social and economic cooperation; relationship between regional and world systems; economic and political integration.
578. **International Relations of Latin America.** (3:3:0) S. (m) Recommended: Pol. Sci. 170 and 359. Tullis Political, economic, and cultural problems that arise from the relationships between the nations of Latin America and the United States.
580. **International Relations of Asia.** (3:3:0) F.S. (m) Recommended: Pol. Sci. 170 and/or 370 or Hist. 341. Farnsworth, Hillam Analysis of the forces and issues which influence the international system of Asia.
630. **Administrative Analysis.** (3:3:0) F.S. Grow, Harlow, Williams The practical application of research tools and techniques to administrative and community (public) problems; field experience is emphasized; report writing.
632. **Public Policy Development and Program Planning.** (3:3:0) F.S. Grow, Snow, Williams, Wright An examination of the formation of public policy; the role of the public administrator in the development of public policy, program planning and implementation.
633. **Contemporary Issues and Public Administration.** (3:3:0) F.S. Buckwalter, Grow, Snow, Williams, Wright An examination of contemporary and critical community issues and their impact upon the administration of American public bureaucracy.

- 634. Practicum in Public Administration.** (1-3:1-3:0 ea.) Prerequisites: consent of graduate sponsor and director of Institute of Government Service. Grow, Harlow, Snow, Wright  
An internship experience in a government agency.
- 645R. Graduate Colloquium.** (½:1:0 ea.) F.S. Buckwalter  
Required of all graduate students each semester in residence.
- 690R. Seminar in Political Theory.** (1-3:1-3:0 ea.) (m) Prerequisite: related advanced course(s). Melville, Midgley, Sorenson
- 691R. Seminar in Politics.** (1-3:1-3:0 ea.) (m) Prerequisite: related advanced course(s). Buckwalter, Grow, Melville, Slover
- 694. Project in Public Administration.** (3:0:Arr.) Buckwalter, Grow, Slover, Snow, Williams, Wright
- 695R. Seminar in Foreign Governments and Comparative Politics.** (1-3:1-3:0 ea.) (m) Prerequisite: related advanced course(s). Farnsworth, Mabey, Morrell, Tullis
- 696R. Seminar in Public Law.** (1-3:1-3:0 ea.) (m) Prerequisite: related advanced course(s). Melville, Reeder, Williams
- 697R. Seminar in International Relations.** (1-3:1-3:0 ea.) (m) Prerequisite: related advanced course(s). Buckwalter, Farnsworth, Hickman, Hillam, Taylor
- 698R. Directed Readings in Political Science.** (1-2:1-2:0 ea.) F.S.Su. Prerequisite: permission of graduate committee and instructor.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.

## Psychology

**Professors:** Allen, Hardy, Howell (graduate coordinator, 1240-B SFLC), Moffitt, Robinson.

**Associate Professors:** Bennion, Bunker, Cooper, Cundick, Daniels, Jensen, Payne, Pedersen (chairman, 1230-A SFLC), Smith, Stimpson.

**Assistant Professors:** Chournos, Jenkins, Merrill, Sorenson, Thorne, Weight.

**Special Instructor:** Kiger.

The Department of Psychology offers graduate programs leading to the M.S. and Ph.D. degrees.

At the master's-degree level, the program in general psychology prepares the candidate for doctoral study or for teaching in the junior colleges, or permits the graduate to enter beginning professional employment in a variety of settings. A four-semester master's program in school psychology and a master's degree in instructional psychology is offered jointly with the Education Area.

At the doctoral level, the department offers specializations in clinical and social psychology, with minors or joint minors in measurement, genetic, personality, motivation, learning, cognition, and social, as detailed below. A doctoral degree in instructional psychology is offered jointly with the Department of Educational Psychology.

Prospective graduate students are expected to acquaint themselves with all general regulations for advanced degrees as outlined by the Graduate School. Admittance to graduate work in psychology requires completion of the following undergraduate courses: general psychology, elementary psychological statistics, experimental psychology, and three courses chosen from sensation and perception, motivation, personality, and principles of learning or their equivalent. Completed applications and supporting documents must be filed with the dean of the Graduate School by March 1. Completed applications and supporting documents received after this date and before July 15 will be considered within the limits of the remaining available positions for September admission.

For the graduate minor in psychology the student must have twelve semester hours of psychology courses as undergraduate preparation. In addition to these,

he must have a minimum of nine semester hours that will be counted as graduate credit.

As part of the training of graduate students, a psychological clinic is maintained by the Psychology Department for the diagnosis and treatment of behavioral and emotional disorders in children and adults. A limited number of selected individuals will be accepted depending on the training needs of the department.

### The Master's Degree Program

All candidates for the master's degree must take the following courses or their equivalent: Psych. 670, Advanced Statistics I (3 hours); 671, Advanced Statistics II (3 hours); 690, Seminar: Research Problems (2 hours) which should be taken during the first semester of residence; and at least six hours to be selected in consultation with the student's advisory committee chairman from the following courses:

- 520. Research and Method in Genetic Psychology (3 hours)
- 530. Theory and Research in Social Psychology (3 hours)
- 550. Personality Theory (3 hours)
- 560. Learning Theory (3 hours)
- 610. History and Systems of Psychology (3 hours)
- 565. Motivational Psychology (3 hours)
- 385. Physiological Psychology (3 hours)
- or, 585. Advanced Physiological Psychology (3 hours)

Twelve additional hours, plus six hours of thesis credit, will comprise the master's program of thirty-two hours. Since all of the courses listed above are required in the doctoral program, it is to the advantage of the student who is going on for his doctorate to complete all or most of these courses as part of his master's program.

A student may either have a minor from another department offering graduate work or follow Option II which provides for a minor within the major department.

Requirements for the degree include (1) completion of the above courses and others as required by the advisory committee; (2) completion of a thesis which is supervised by the student's advisory committee; (3) satisfactory performance in a final oral examination on the thesis and subject field.

### School Psychology Program

The school psychology program at Brigham Young University is a specialized program which is offered jointly by the Department of Psychology and Education Area. Students wishing to pursue training in school psychology may major in either psychology or education. The preparation for students will be the same in each major except in those areas that are directly related to thesis work.

The specific program in school psychology will be drawn up by the student in consultation with his advisory committee and will include the following course requirements:

- 640. Intelligence Testing (3 hours)
- 641. Personality Testing (3 hours)
- 642. Child and Adolescent Assessment (3 hours)
- 681. Group Therapy (3 hours) or Ed. 647
- 682. Child Therapeutic Techniques (3 hours)
- Ed. 672. Practicum in School Psychology (4 hours)

Psychology majors must take Psych. 670, Advanced Statistics I (3 hours); Psych. 690, Seminar: Research Problems (2 hours); and Psych. 699, Thesis for Master's Degree (6-9 hours), whereas education majors must take Ed. 660, Research Design and Technical Writing in Education (3 hours); Ed. 698, Field Project (2-4 hours); or Ed. 699, Thesis for Master's Degree (6-9 hours). A minimum of ten semester hours as elective courses should be selected with the approval of the student's advisory committee.

Most states require school psychologists to be certified. The certification requirements vary widely from state to state. Accordingly, specific information

from the appropriate agency certifying school psychologists in the state where the student is planning to work should be obtained in his graduate training in order to insure that all the state requirements are incorporated in the student's training program.

### **Doctor of Philosophy Degree**

Admission policies for the doctoral degree are described below under the specific degree programs in clinical and social psychology.

Requirements of the Ph.D. degree include (1) a foreign language requirement. (The student may complete either the Option I or Option II language requirement. In the place of the two-language requirement under Option I it is recommended that the student substitute for one language the following computer courses: Comput. Sci. 131 or 331; Psych. 570; and Comput. Sci. 571 or another approved graduate course, or under Option II the student may substitute the following courses for the single language requirement: Math. 112; Comput. Sci. 131 or 331, 571; Psych. 570, and 672 or 673; and Stat. 433, 531, 534, or 536); (2) formal course work, as detailed below under the specific major; (3) satisfactory completion of the following core courses with a minimum grade of "B—" in each course and an overall grade-point average of 3.2 in these courses:

- 520. Research and Method in Genetic Psychology (3 hours)
- 530. Theory and Research in Social Psychology (3 hours)
- 550. Personality Theory (3 hours)
- 560. Learning Theory (3 hours)
- 610. History and Systems of Psychology (3 hours)
- 565. Motivational Psychology (3 hours)
- 385. Physiological Psychology (3 hours)  
or, 585. Advanced Physiological Psychology (3 hours)
- 670. Advanced Statistics I (3 hours)
- 671. Advanced Statistics II (3 hours)
- 690. Seminar: Research Problems (2 hours)

(The student who has satisfactorily completed any of these courses at the master's level is considered to have met the same requirement(s) at the doctoral level); (4) specialty examinations covering the student's major field and his minor field(s) which will ordinarily be taken at the end of his second year of doctoral study; (5) a dissertation embodying the results of original research of professional caliber done under the supervision of the advisory committee; and (6) a final oral examination covering the dissertation.

Fields presently available for doctoral specialization are as follows:

<b>Major Fields</b>	<b>Minor Fields*</b>	<b>Joint Minors**</b>
Clinical	Social	Genetic, Motivation, Cognition, Social,
Social	Measurement Personality	Personality, Learning, Measurement

\*The minor requires a minimum of twelve hours of course work.

\*\*Two of these areas may be combined to compose a minor, as approved by the advisory committee with at least six hours in each area.

**The Ph.D. in Clinical Psychology.** Students are encouraged to apply for the doctoral program in clinical psychology near the completion of their undergraduate work, although those with master's degrees will also be considered.

The major in clinical psychology will be drawn up by the student in consultation with his advisory committee and will include the following requirements: (1) the requirements as listed above; (2) a one-year internship in a hospital or institution approved by the department; (3) participation in sensitivity training (Psych. 784R) which is required during the first year of graduate training; (4) the following clinical courses:

- A. Psychodynamics (6 hours)
- 651. Psychopathology (3 hours)
- 675. Personality Dynamics (3 hours)

**B. Assessment (12 hours)**

- 640. Intelligence Testing (3 hours)
- 641. Personality Testing (3 hours)
- 642. Child and Adolescent Assessment (3 hours)  
or, 643. Adult Assessment (3 hours)
- 740R. Practicum in Assessment (3 hours ea.) (One course in 740)

**C. Treatment (12 hours)**

- 680. Introduction to Psychotherapy (3 hours)
- 681. Group Therapy (3 hours)
- 682. Child Therapeutic Techniques (3 hours)
- 781R. Practicum in Psychotherapy: Child (3 hours ea.)  
or, 789R. Practicum in Psychotherapy: Adult (3 hours ea.)

In addition to these required courses the following courses are recommended:

- 526. Mental Retardation (2 hours)
- 630. Attitude Change (3 hours)
- 644. Advanced Rorschach (3 hours)
- 645. Professional Problems in Psychology (3 hours)
- 665. Human Motivation (3 hours)
- 683. Behavior Modification Therapy (3 hours)
- Org. Behav. 672. The Consultative Process (3 hours)
- Org. Behav. 675. Theory and Method of Laboratory Training (3 hours)

**The Ph.D. in Social Psychology.** In general, students are not admitted to the doctoral program in social psychology until completion of a master's degree (research experience of an equivalent nature may be approved by the department).

The major in social psychology will be drawn up by the student in consultation with his advisory committee from the following, plus appropriate supporting courses. It is understood that the student will have completed the graduate core courses or their equivalent.

- 555. Group Dynamics (3 hours)
- 630. Attitude Change (3 hours)
- 792R. Seminar: Social Psychology (2 hours)
- Sociology 552. Personality: Culture and Society (3 hours)
- Org. Behav. 672. The Consultative Process (3 hours)
- Org. Behav. 675. Theory and Method of Laboratory Training (3 hours)

**Courses**

**510. The Psychology of Aesthetics.** (2:2:0) (Offered alternate years) Prerequisite: Psych. 111. Daniels

The arts of perceptual stimuli; the nature of artistic creativity; psychological symbolism expressed in the arts; the artist as a person.

**520. Research and Method in Genetic Psychology.** (3:3:0) Cundick, Jensen  
An overview of major research in genetic psychology with emphasis placed on theory, content, and methodology.

**526. Mental Retardation.** (2:2:0) Prerequisite: Psych. 378 or equivalent. Allen, Thorne

**530. Theory and Research in Social Psychology.** (3:3:0) Prerequisite: Sociol.-Psych. 350. Hardy, Stimpson

A survey, in depth, of current theory and research in social psychology, with emphasis on understanding the individual in his interpersonal interaction.

**550. Personality Theory.** (3:3:0) Prerequisites: Psych. 111, 450, and five additional hours in psychology. Allen, Bennion, Howell, Thorne

A critical review of the contemporary theories of personality that have been developed within the framework of major psychological systems.

**555. (Sociol.-Psych.) Group Dynamics.** (3:3:0) Prerequisite: Sociol.-Psych. 350. Dyer, Hardy, Moffitt, Smith, Stimpson

May be used for credit either in psychology or sociology, but not in both. Research and theories in group dynamics.

- 560. Learning Theory.** (3:3:0) Prerequisites: Psych. 111, 460, and five additional hours in psychology. Allen, Cooper, Jensen, Merrill  
A critical review of current theories of learning and persistent problems.
- 561. Introduction to Psycholinguistics.** (3:3:0) Prerequisite: Psych. 111. Brown  
A survey of research and theory in verbal learning and verbal behavior, and the social implications of language usage.
- 562. Perception and Cognition.** (3:3:0) Prerequisites: Psych. 360, 362, or equivalent; graduate standing or consent of instructor. Allen, Daniels  
A study of major theoretical and empirical developments in perception and cognition with emphasis on the interaction of sensory, perceptual, learning, and thinking processes.
- 565. Motivational Psychology.** (3:3:0) Prerequisites: Psych. 365 or equivalent; graduate standing or consent of instructor. Daniels, Hardy  
Historical development of motivational psychology; theoretical and empirical overview of the field; recent trends and current issues. Role of animal studies; methodological problems.
- 570. Computer Use in Behavioral Sciences.** (3:3:6) Prerequisite: Psych. 370; Comput. Sci. 331; or equivalent. Carlson  
The use of electronic digital computers in the behavioral sciences.
- 574. Advanced Experimental Psychology.** (2:1:5) Prerequisites: Psych. 111, 374, or equivalent. Merrill  
Principles of instrumentation; varieties of experimental designs; nature of experimental controls. Gives experience in planning, conducting, and reporting original exploratory experiments.
- 580. Comparative Psychology.** (3:3:0) Prerequisite: Psych. 111. Merrill  
Survey of methods and results of research on animal learning, innate behavior, motivation, individual differences, social behavior, abnormal behavior; correlation of structure with function.
- 583. Behavior Modification Techniques.** (3:2:2) Thorne  
Various practical applications of principles of behavior modification to academic, discipline, and emotional target behaviors of individuals and groups.
- 585. Advanced Physiological Psychology.** (3:3:0) Prerequisite: Psych. 111. Merrill  
Critical study of physiological processes and psychological functions; physiological mechanisms underlying behavioral processes, including sensation, emotion, sleep and activity, motivation, and learning.
- 598R. Independent Research.** (1-3:0:2-6 ea.)
- 610. History and Systems of Psychology.** (3:3:0) Prerequisite: graduate standing. Allen, Howell  
A survey of the origins and development of modern psychology including consideration of the schools and theoretical systems which have emerged up to the present day.
- 620. Advanced Genetic Psychology.** (3:3:0) Prerequisite: Psych. 520. Cundick  
A critical consideration within the developmental framework of factors affecting socialization, intelligence, motor development, language processes, and other important behavioral variables.
- 628. Psychology of the Physically Handicapped.** (2:2:0) Prerequisite: Psych. 378.
- 630. Attitude Change.** (3:3:0) Prerequisite: graduate standing or consent of instructor. Stimpson  
An examination of various theoretical approaches to the study of attitude development, change, and assessment, including a focus on both individual and mass persuasion.

- 640. Intelligence Testing.** (3:3:5) Prerequisites: Psych. 378 or Ed. 645 and consent of instructor. Bennion, Cundick, Howell
- 641. Personality Testing.** (3:2:3) Prerequisites: Psych. 550, 640. Bennion Robinson
- 642. Child and Adolescent Assessment.** (3:2:6) Prerequisite: Psych. 640. Bennion, Cundick
- 643. Adult Assessment.** (3:2:5) Prerequisite: Psych. 641. Howell
- 644. Advanced Rorschach.** (3:2:5) Prerequisite: Psych. 643. Howell
- 645. Professional Problems in Psychology.** (3:3:0) Prerequisite: major or minor in psychology. Howell
- 646. Community Mental Health.** (3:2:2) Prerequisite: at least second-year graduate standing in the Department of Psychology. Howell  
Procedures for community mental health consultation. Principles of program evaluation. Epidemiology of crime, alcoholism, suicide, psychoses, and mental retardation.
- 651. Psychopathology.** (3:3:2) Prerequisite: nine hours in psychology. Bennion, Howell, Thorne
- 654. Dynamics of Religious Behavior.** (3:3:0) Prerequisite: Psych. 111. Allen
- 662. Complex Thought Processes.** (3:3:0) Prerequisite: Psych. 360. Daniels
- 665. Human Motivation.** (3:3:0) Prerequisite: Psych. 365 or equivalent; graduate standing in psychology or allied discipline. Hardy
- 670. Advanced Statistics I.** (3:3:2) Prerequisite: Psych. 370. Pedersen
- 671. Advanced Statistics II.** (3:3:2) Prerequisite: Psych. 670. Pedersen
- 672. Psychological Scaling.** (3:3:0) Prerequisite: Psych. 670. Pedersen  
Scaling theory and methodology, with emphasis upon measurement in psychophysics and differential psychology.
- Organization Behavior 672. The Consultative Process.** (3:3:0)
- 673. Multivariate Analysis in Psychology.** (3:3:0) Prerequisite: Psych. 670. Pedersen  
The principal descriptive statistics used in the analysis of multiple measurements: factor analysis, canonical correlation, multivariate analysis of variance and covariance, and multiple discriminant analysis.
- 675. Personality Dynamics.** (3:3:0) Prerequisites: undergraduate core courses and consent of instructor. Howell, Thorne
- Organization Behavior 675. Theory and Method of Laboratory Training.** (3:2:2)
- 678. Measurement Theory.** (3:3:0) Cooper, Pedersen
- 680. Introduction to Psychotherapy.** (3:3:0) Prerequisites: undergraduate core courses and consent of instructor. Bennion, Robinson, Thorne
- 681. Group Therapy.** (3:1:6) Prerequisite: Psych. 680. Howell, Thorne
- 682. Child Therapeutic Techniques.** (3:3:3) Prerequisites: undergraduate core courses and consent of instructor. Cundick, Howell, Thorne
- 683. Behavior Modification Therapy.** (3:2:1) Prerequisites: Psych. 460, 680; or equivalent. Thorne
- 690. Seminar: Research Problems.** (2:2:0)
- 695R. Independent Readings.** (1-2:Arr.:Arr. ea.)
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

- 740R. Practicum in Assessment.** (3:0:8 ea.) Prerequisites: Psych. 642, 643.  
Bennion, Howell, Payne
- 749R. Clinics Practicum.** (1-2:0:3-6 ea.) Prerequisites: Psych. 640, 680; graduate standing or consent of instructor.
- 750, 751, 752, 753. Clinical Internship.** (2:0:40 ea.)
- 781R. Practicum in Psychotherapy: Child.** (3:0:8 ea.) Prerequisite: Psych. 682.  
Bennion, Howell, Thorne
- 784R. Sensitivity Training.** (0:0:3 ea.) Howell
- 789R. Practicum in Psychotherapy: Adult.** (3:0:8 ea.) Prerequisite: Psych. 680.  
Bennion, Howell, Thorne
- 790R. Seminar in Genetic Psychology.** (2:2:0 ea.) Prerequisite: consent of instructor.  
Cundick
- 791R. Seminar: Personality.** (2:2:0 ea.) Prerequisite: consent of instructor.
- 792R. Seminar: Social Psychology.** (2:2:0 ea.) Prerequisites: consent of instructor; Sociol.-Psych. 350.  
Hardy, Smith, Stimpson
- 793R. Seminar: Perception and Cognition.** (2:2:0 ea.) Prerequisite: consent of instructor.
- 794R. Seminar: Motivation.** (2:2:0 ea.) Prerequisite: consent of instructor.  
Daniels, Hardy
- 795R. Seminar: Learning.** (2:2:0 ea.) Prerequisite: consent of instructor.  
Cooper, Jensen, Merrill
- 796R. Seminar: Psychotherapy.** (2:2:4 ea.) S. Prerequisite: consent of instructor.
- 797R. Independent Research.** (1-4:0:3-12 ea.) Prerequisite: consent of instructor.
- 799. Ph.D. Dissertation.** (Arr.)

## Recreation Education

**Professors:** Hartvigsen, I. Heaton, Jensen, Shaw (college coordinator, 221-F RB).

**Associate Professors:** Call, Hafen (chairman 273-C RB), Packer.

**Assistant Professors:** De Hoyos, Thorstenson.

### Requirements

An undergraduate major or equivalent in recreation or acceptance by the departmental graduate committee is necessary for admission. A qualifying written and oral examination may be given each student before final acceptance.

With the approval of the department chairman and the advisory committee, a student may pursue one of two degrees.

### Master of Arts Degree

This degree will be awarded upon the completion of a minimum of twenty-four hours of prescribed course work, an approved thesis, and satisfactory performance in final written and oral examinations. Three options are allowed:

**Option 1.** Major combined with a minor:  
Course work required in major  
Course work required in minor  
Thesis

	15 hrs.
	9 hrs.
	6 hrs.
Total	<hr/> <hr/> <hr/> 30 hrs.

<b>Option 2.</b> Major combined with a related area:		
Course work required in major		15 hrs.
Course work required in major or related area		9 hrs.
Thesis		6 hrs.
	<b>Total</b>	<b>30 hrs.</b>
<b>Option 3.</b> Major in community school leadership:		
Work in required courses and elective courses		24 hrs.
Thesis		6 hrs.
	<b>Total</b>	<b>30 hrs.</b>

### Master of Recreation Education Degree

This degree will be awarded upon the completion of a minimum of thirty-two hours of prescribed course work including an approved field project and satisfactory performance in final written and oral examination. Three options are allowed:

<b>Option 1.</b> Major combined with a minor:		
Course work required in major (including field project)		20 hrs.
Course work required in minor		9 hrs.
Additional elective hours		3 hrs.
	<b>Total</b>	<b>32 hrs.</b>
<b>Option 2.</b> Major combined with a related area:		
Course work required in major (including field project)		20 hrs.
Course work required in major or related area		12 hrs.
	<b>Total</b>	<b>32 hrs.</b>
<b>Option 3.</b> Major in community school recreation:		
Course work required in program (including field project)		32 hrs.
	<b>Total</b>	<b>32 hrs.</b>

Areas of special emphasis on the master's degree include the following selections: community school recreation, therapeutic recreation and recreation administration. For additional information regarding the master's degree in recreation, write to the department chairman, 273-C RB.

### Courses

- 502R. **Camping Workshop.** (2:2:4 ea.) F.Su. (m) Fee required. Hansen, Packer  
Featuring training and preparations for a week of laboratory experience  
in a primitive area.
503. **Administration of School and Community Camps.** (2:2:0) S.Su. (m) Hansen  
Objectives and problems involved in establishing community and school  
camps. Best practices dealing with location, safety, health, and programs  
of activity are thoroughly analyzed.
505. **Administration of Community Recreation.** (3:3:0) F.S.Su. (m) Prerequi-  
sites: Rec. Ed. 301, 337. Naylor  
Problems peculiar to the organization and administration of a community  
recreation program, including objectives, legal aspects, facilities, personnel,  
activities, records, and finances.
570. **Therapeutic Recreation for Neurological Handicaps.** (2:2:0) F.S.Su. (m)  
Prerequisites: Rec. Ed. 370, 470, or equivalent. Call  
Application of recreation for patients with neurological and other general  
handicaps. Consideration of etiology of conditions, characteristics of  
individuals, and recreation programs for patients in school, community,  
and hospital settings.

- 583. Workshop in Recreational Dance.** (1-2:0:40-80) F.Su. Advanced techniques for teaching dance to all types of groups. A. Heaton
- 595. The Community School.** (2:2:1) F.Su. The basic concepts of the community school, including its history, philosophy, organization, function, building utilization, typical programs, and leadership qualifications. I. Heaton, Olsen
- 605. Community School Administration.** (2:2:0) F.Su. Concerned with the analysis and study of community school administrative problems, especially as they relate to leadership, finance, facilities, legal aspects, communication, and public relations. I. Heaton, Olsen
- 609. The Recreation Program.** (2:2:0) F.Su. Analysis and design of community and agency recreation programs. Thorstenson
- 670. Problems in Recreation for the Neuropsychiatric Patient.** (2:2:0) S.Su. Prerequisites: Rec. Ed. 370, 470, or equivalent. Call Includes consideration of classification, etiology characteristics, medical treatment and recreational programs in resident, day care, and out-patient facilities for emotionally or psychologically disturbed patients.
- 671. Therapeutic Recreation in Rehabilitation.** (2:2:0) F.Su. Prerequisites: Rec. Ed. 370, 470, or equivalent. Call Designed to acquaint the student with the rehabilitation team and the relationship of therapeutic recreation to other members of the team.
- 679A,B. Internship in Community School Leadership.** (6:2:20 ea.) F.S.Su. Prerequisite: consent of instructor. I. Heaton, Olsen Students are assigned to work with experienced community school directors where they gain practical experience in the areas of planning, organizing, leading, scheduling, participating in faculty and community council meetings, visiting homes, and public relations.
- 692. Research Methods in Recreation.** (3:3:0) F.Su. Shaw Preparation of the research proposal and guidelines to writing the thesis.
- 694. Seminar in Readings.** (2:2:0) F.Su. Hafen
- 695. Seminar in Community-School Recreation.** (2:2:0) F.S.Su. I. Heaton, Olsen Community-school organization, finance, programming and leadership for recreation.
- 696. Seminar in Problems in Recreation.** (1:1:0) S.Su. Hafen
- 698. Field Projects.** (1-4:2-5:0) F.S.Su. Hafen
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. Hafen

## Religious Instruction—Ancient Scripture

**Professors:** R. L. Anderson, Clark, Ludlow, Nibley, Patch, Sperry (emeritus).  
**Associate Professors:** Pearson, H. D. Peterson, Rasmussen (chairman, 121 JSB).

**Assistant Professors:** Cheesman, Harris, Nyman.

Detailed statements of the requirements and procedures for the various degree programs of the Department of Ancient Scripture may be obtained upon request from the chairman. The responsibility for knowing and fulfilling these requirements as well as the general requirements of the Graduate School rests with the student.

**Master of Arts Degree**

After acceptance by the Graduate School and the College of Religious Instruction for work on a degree, the student must fulfill the following requirements under the direction of his advisory committee:

1. Attain a minimum of twenty-four semester hours of credit in approved courses not including his thesis credit. A minimum of six hours of thesis credit is required, but more may be earned.
2. Demonstrate proficiency in the scholarly use of one approved foreign language which will be usable in his research study.
3. Write an acceptable thesis embodying the results of well-organized, original research.
4. Complete successfully a written examination on the course work. This examination is administered three times yearly, in October, March, and July.
5. Complete successfully an oral examination on course work and thesis.

**Doctor of Philosophy Degree**

Applicants for the doctorate must demonstrate proficiency in one tool language and an adequate subject-matter background to be considered for admission to the department on a degree-seeking basis. After acceptance on a degree-seeking basis, the student must fulfill the following requirements under the direction of his advisory committee:

1. Develop and demonstrate proficiency in the scholarly use of an additional foreign language having relevance for his study areas.
2. Attain a minimum of sixty hours of approved course work credit, plus eighteen hours of dissertation credit. The following core courses are required of all students: Relig. 501, 502, 503, 511, 512, 513, 521, 522, 524, 525, and 527.
3. Pass four four-hour written comprehensive examinations plus an oral examination in the same areas. In these examinations the student is given the opportunity to demonstrate a thorough mastery of the subject matter of the major and minor fields. These examinations are administered three times yearly, in October, March and July.
4. Write an acceptable dissertation, embodying the results of original research and constituting a valuable addition to scholarly knowledge.
5. Complete successfully an oral examination of the scholarship and writing exhibited in the candidate's dissertation.

**Courses**

501. The Old Testament: Pentateuch and Historical Books. (3:3:0) F.Su.
502. The Old Testament: Prophetic Books. (2:2:0) S.Su.
503. The Old Testament: Poetic and Wisdom Literature. (2:2:0) S.Su.
511. The Gospels. (2:2:0) F.Su.
512. Paul's Life and Letters. (2:2:0) F.Su.
513. The General Epistles and the Apocalypse. (2:2:0) S.Su.
514. New Testament Times. (2:2:0) S.Su.
521. Analysis of the Book of Mormon I. (3:3:0) F.Su.
522. Analysis of the Book of Mormon II. (3:3:0) S.Su.
523. External Evidences of the Book of Mormon. (2:2:0) Su.
527. History and Doctrines of the Pearl of Great Price. (3:3:0) F.Su.
604. Origins of the Old Testament. (3:3:0) F.Su.

- 606. The Apocrypha and Pseudopigrapha.** (2:2:0)
- 608R. Readings in Old Testament Studies.** (1-6:1-2:0 ea.) F.S.Su.
- 609R. Seminar: Old Testament.** (1-6:1-2:0 ea.) F.S.Su.
- 610. Early Christian Literature.** (2:2:0) F.
- 611. Formation of the New Testament: Test and Canon.** (2:2:0)
- 612. Textual Criticism of the New Testament.** (2:2:0)
- 618R. Readings in New Testament.** (1-6:1-2:0 ea.) F.S.Su.
- 619R. Seminar: New Testament.** (1-6:1-2:0 ea.) F.S.Su.
- 621R. Seminar: Book of Mormon.** (1-6:1-2:0 ea.) F.S.Su.
- 627R. Seminar: Pearl of Great Price.** (1-6:1-2:0 ea.) F.S.Su.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)
- 799. Doctoral Dissertation.** (Arr.)

## Religious Instruction—Church History and Doctrine

**Professors:** Andrus, Backman, Barron, Doxey, Horsley, Palmer, Rich, Turner.  
**Associate Professors:** L. Berrett (chairman, 123 JSB), Bowen, Cowan, Hartshorn, M. Petersen.

The Department of Church History and Doctrine offers a program leading to the master's or doctoral degree in the history of religion. A general statement of the requirements for each degree is given below. A detailed statement of requirements for these degrees may be obtained upon request from the chairman of the Department of Church History and Doctrine. **The responsibility for knowing and fulfilling these requirements as well as the general requirements of the Graduate School rests with the student.**

### Master of Arts Degree

Prerequisites to either a major or a minor in history of religion are the courses Religion 341 and 342 plus a knowledge of the contents of **The Comprehensive History of the Church**, by B. H. Roberts.

After acceptance on a degree-seeking basis, the student must fulfill the following requirements under the direction of his advisory committee:

1. Attain a minimum of twenty-four semester hours of credit in approved courses not including thesis credit. A minimum of six hours of thesis credit is required, but more may be earned. The following course is required of all students: Relig. 540.
2. Demonstrate proficiency in the scholarly use of one approved foreign language. Those students whose emphasis is in LDS Church history are not required to have a language.
3. Write an acceptable thesis embodying the results of directed research.
4. Complete successfully a written examination on the course work. This examination is administered three times yearly, in October, March and July.
5. Complete successfully an oral examination on course work and thesis.

### Doctor of Philosophy Degree

Applicants for the doctorate must demonstrate a proficiency in one tool language and an adequate subject-matter background to be considered for ad-

mission to the department on a degree-seeking basis. After acceptance on a degree-seeking basis, the student must fulfill the following requirements under the direction of his advisory committee:

1. Demonstrate proficiency in the scholarly use of at least two foreign languages.
2. Attain a minimum of sixty hours of approved course work credit, plus a minimum of eighteen hours of dissertation credit. The following core courses are required of all students: Relig. 540, 541, 542, 543, 544, 547, 551 or 553, and 555 and 556.
3. Pass four four-hour written comprehensive examinations plus an oral examination in the same area. In these examinations the student is given the opportunity to demonstrate a thorough mastery of the subject matter of the major and minor fields. These examinations are administered three times yearly, in October, March and July.
4. Write an acceptable dissertation embodying the results of original research and constituting a valuable addition to scholarly knowledge.
5. Complete successfully an oral examination of the scholarship and writing exhibited in the candidate's dissertation.

#### **Graduate Courses**

(Note: Courses where the semester is not designated are specialized offerings given on demand. Consult the class schedule for the latest changes in scheduling.)

- 524. **Analysis of the Doctrine and Covenants I.** (3:3:0) F.S.Su.
- 525. **Analysis of the Doctrine and Covenants II.** (3:3:0) F.S.Su.
- 530. **LDS Theology.** (2:2:0) F.S.Su.
- 540. **Historiography and the Writing of LDS History.** (3:3:0) F.Su.
- 541. **Documents of LDS Church History (1820-1839).** (3:3:0) F.Su.
- 542. **Documents of LDS Church History (1839-1850).** (3:3:0) S.Su.
- 543. **Documents of LDS Church History (1850-1900).** (3:3:0) F.Su.
- 544. **Documents of LDS Church History (1900 to Present).** (3:3:0) S.Su.
- 546. **Social, Economic, and Political Thought of Joseph Smith.** (2:2:0)
- 547. **Historical Setting of Mormonism.** (3:3:0)
- 551. **History of the Early Church to the Fourth Century.** (3:3:0)
- 553. **Christian Rites and Liturgy.** (2:2:0)
- 554. **Martin Luther, Forerunner of the Restoration.** (2:2:0)
- 555. **Comparative World Religions.** (2:2:0) F.Su.
- 556. **Comparative World Religions.** (2:2:0) S.Su.
- 557. **Religions of the Ancient Near East.** (2:2:0)
- 559. **The Church in Asia.** (2:2:0)
- 570. **Survey of Religious Education.** (2:2:0) S.Su.
- 571. **Methods of Teaching Religion in Secondary Schools.** (2:5:0) Su.
- 572. **Methods of Teaching Religion in Secondary Schools.** (2:5:0) Su.
- 579A,B,C,D,E. **Seminar: Gospel Principles in the Scriptures and Church History.** (2:5:0 ea.) Su.  
A—Old Testament; B—New Testament; C—Book of Mormon; D—Doctrine and Covenants; E—Church History.

- 595A,B. Graduate Seminar.** (1-2:2:0 ea.) F.S.  
Discussions on religious topics of current interest for graduate students not majoring in religion.
- 596A,B. Graduate Seminar.** (1-2:2:0 ea.) F.S.  
Discussions on religious topics of current interest for graduate students not majoring in religion.
- 624R. Seminar: Doctrine and Covenants.** (1-6:1-2:0 ea.)
- 628R. Readings in Modern Scripture.** (1-6:1-2:0 ea.)
- 638R. Readings in Christian Theology.** (1-2:Arr.:0 ea.)
- 643. Schismatic Movements in Mormon History.** (2:2:0)
- 647. LDS Church History by Travel Study.** (2:Arr.:Arr.)
- 648R. Readings in LDS Church History.** (1-6:1-2:0 ea.)
- 649R. Seminar: History of Religion.** (1-6:1-2:0 ea.)
- 653. History of the Papacy.** (2:2:0)
- 654. Reformation and Counter-Reformation.** (2:2:0)
- 657. Comparative Studies in American Religions.** (3:3:0)
- 658R. Readings in Christian History.** (1-6:1-2:0 ea.)
- 659R. Seminar in History of Asian Religion.** (1-6:1-2:0 ea.)
- 668R. Readings in the History of World Religions.** (1-6:1-2:0 ea.)
- 671. Curriculum of Religion in Secondary Schools.** (2:5:0) Su.
- 672. Religious Curriculum Building for Secondary Schools.** (2:5:0) Su.
- 673. Methods of Teaching Religion in College.** (2:5:0) Su.
- 674. Methods of Teaching Religion in College.** (2:5:0) Su.
- 675. Curriculum of Religion in College.** (2:5:0) Su.
- 676. Religious Curriculum Building for Colleges.** (2:5:0) Su. Prerequisite: Relig. 675.
- 677. Problems of Teaching Religion.** (1:3:0)
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.
- 799. Doctoral Dissertation.** (Arr.) F.S.Su.

## Sociology

**Professors:** Bradford, Christiansen, Larsen, Peterson (chairman, 184 FOB), Smith, Staley, Symons.

**Associate Professors:** Craig, Duke, Kunz (graduate coordinator, 179 FOB), Payne, Seggar, Spencer.

**Assistant Professors:** Blake, Brinkerhoff, Condie, G. De Hoyos.

## Requirements

The Department of Sociology offers training for the Master of Science degree and the Doctor of Philosophy degree. It is expected that graduate students will acquaint themselves with all the general regulations for advanced degrees as outlined by the Graduate School.

**Master's Degree**

The requirements for the master's degree in sociology include the general requirements of the Graduate School. A complete statement of rules and procedures of the master's degree program in sociology is available from the department chairman or the graduate coordinator.

Admission to the master's degree program in sociology requires a bachelor's degree from an accredited university plus a minimum of fifteen semester hours or its equivalent in sociology including courses in introductory sociology, social disorganization, introductory statistics, methods of research in sociology, development of sociological theory, and contemporary sociological theory. Each applicant must submit scores from the Graduate Record Examination in both the general and sociology areas.

The department requires additional evidence concerning the applicant's ability to pursue graduate work. An oral screening examination is required of all students who are admitted on a degree-seeking basis. The fields in which the examinations are to be taken are sociological theory, statistics, research methods, and social organization-disorganization. This examination must be taken not later than the second week of the graduate student's first semester of graduate work or, if the student enters during the Summer Session, not later than the first week of the Summer School term in which he first registers. All examinations must be completed within the week in which the student begins his examination.

The screening examinations serve two purposes:

1. They help to discover those students whose ineptness in the field is such that they should be advised not to continue.
2. They reveal strengths and weaknesses of a given student so that the most meaningful program can be arranged for him.

The student should discuss the results of his screening examination with his advisory committee chairman. If the student's performance on the examination is such that he is permitted to continue toward his degree, the department reserves the right to examine him again at a later date in the areas in which his test performance was below standard. The department may prescribe remedial work or other requirements as a condition for admission. The student must complete such work with a grade of "B" or better.

The student must satisfactorily complete the following courses: Sociol. 524, 597R, 690, and at least one graduate seminar in addition to Sociol. 690, plus other courses selected by the student in consultation with his advisory committee. Prior to registering for the last fifteen semester hours of credit applying toward the degree, the student should file his graduate course program with the Office of the Graduate Dean and prior to registering for his last semester of work applying toward the degree, he should file a prospectus of his thesis. An oral preliminary examination is given the student on the prospectus prior to the collection of the data. A written comprehensive examination must be taken by the student before completion of his thesis.

**Doctor of Philosophy Degree**

Students intending to enter the doctoral program in sociology should obtain from the department chairman or graduate coordinator a complete statement of rules and procedures. In addition to the general requirements of the Graduate School, a student working toward a doctorate in sociology must fulfill the following specific requirements:

1. **Requirements for Admission.** For admission to the doctoral program in sociology the student must furnish evidence of having received a master's degree or its equivalent in sociology or a closely related field from an accredited university. In addition, the student must pass screening examinations in the following areas: sociological theory, statistics, research methods, and social organization-disorganization. Screening examinations must be taken by the sixth week of the student's first semester of residence. The department may then prescribe remedial work or other requirements as a condition for admission. The student

must complete such work with a grade of "B" or better. The screening examination will be an oral examination. See admission information under "Master's Degree." Each applicant must submit scores from the Graduate Record Examination in both the general and sociology areas.

**2. Student's Advisory Committee.** The members of the advisory committee are nominated by the student in consultation with the department chairman and with the approval of the dean of the Graduate School. Four men from the department plus one from outside the department comprise the advisory committee.

**3. Major and Minor Fields.** The student must have two major fields within sociology, one of which must be research methods. A major field is a field of study in which the student specializes both in respect to teaching and research. It is presumably the field in which the dissertation is to be written and upon which the professional career is to be based.

The student must have two minor fields, one of which may be selected from another department in lieu of one of the minor fields in sociology. A minor field is construed as a field of study in which the student may teach and/or conduct research creditably. It is not the substantive field, however, in which his competence is most highly developed.

The major fields must be selected from the following: deviant behavior, social psychology, research methods, social organizations, and sociological theory. With the exception of research methods, the minor fields may be selected from the preceding and the following: demography, family and rural sociology.

A student may elect to have a minor in a field not listed above. To do so he must submit a proposed program of study to his advisory committee at least twelve months in advance of the comprehensive examinations. This committee, with the approval of the members of the department, may authorize an alternate minor field in sociology.

**4. Comprehensive Examinations.** The student must pass comprehensive examinations after the completion of prescribed course work and at least one year prior to the granting of the degree. These comprehensive examinations will be given the fifth week of the Fall and Spring Semesters. Unless a major is selected in another department, the examinations are in four of the above fields of sociology, two of which must be (a) sociological theory and (b) research methods.

#### Requirements for a Minor in Sociology

A student working toward a master's degree completes the departmental requirements for a minor in sociology by satisfactorily completing Sociology 690 plus graduate semester hours in areas related to his major specialization in his field as approved by his advisory committee, a member of which is from the Department of Sociology.

A student working toward the doctoral degree with a major in another department and with a minor in sociology takes a preliminary screening examination, after which a committee member from the Department of Sociology, with the approval of the other members of the department, outlines a program in accordance with the needs of the student.

#### Graduate Courses Grouped According to Major-Minor Fields

The following courses are grouped according to the major and minor fields of the doctoral program in sociology. The courses in each field are recommended, but they must be supplemented by other study as defined by the student's advisory committee. Minimum essential bibliographies for these fields are available.

**Demography (minor only):** 623.

**Deviant Behavior (major or minor):** 590, 591, 686.

**Family (minor only):** 560, 590, 660, 693, 760.

**Research Methods (major only):** 524, 561, 597R, 697R, 701.

**Rural Sociology (minor only):** 571, 572, 671, 692.

**Sociological Theory** (major or minor): 690, 691, 698, 791.

**Social Psychology** (major or minor): 530, 542, 552, 555, 630, 792.

**Social Organizations** (major or minor): 501, 512, 516, 543, 551, 570, 580, 626, 696.

### Courses

501. **Political Sociology.** (3:3:0) (m) Prerequisite: Sociol. 111 or consent of instructor. Duke, Seggar  
An analysis of power and decision-making in social groups. Social bases of government and political behavior. Relationship of governmental institutions to other societal institutions.
512. **Sociology of Education.** (2:2:0) F.S. Smith  
Analyzes principles of sociology of education and their implication for theory and practice of school administration, curricula, and methods of instruction.
516. **Sociology of Religion.** (2:2:0) F. Seggar, Staley  
Analyzes influences of social factors in development of various religious systems.
524. **Advanced Social Statistics.** (3:3:0) F. Prerequisite: Sociol. 111. Brinkerhoff, Condie  
Advanced course designed for those who intend to do research or continue in graduate work.
530. **(Sociol.-Psych.) Theory and Research in Social Psychology.** (3:3:0) S. Prerequisite: Sociol.-Psych. 350. Blake, Larsen  
A survey, in depth, of current theory and research in social psychology, with emphasis on understanding the individual in his interpersonal interaction.
542. **Social Movements.** (2:2:0) S. Seggar  
Analyzes social movements as attempts to promote or resist change: civil unrest, racial violence, and student activism.
543. **Social Legislation.** (2:2:0) S.  
Basic problems and techniques of social legislation. Analyzes various systems now in operation.
551. **Sociology of Leisure.** (2:2:0) S.Su.  
Treats recreation and other leisure activities of various social groupings and factors related to participating in them.
552. **Personality: Culture and Society.** (3:3:0) F. (m) Prerequisite: Sociol. 111 or Psych. 111. Christiansen, G. De Hoyos, Larsen, Staley  
Study of the role of culture and society in the forming and functioning of personality. Compares various peoples and cultures.
555. **(Sociol.-Psych.) Group Dynamics.** (3:3:0) S. (m) Prerequisite: Sociol. 350. Larsen  
Analyzes research and theories of group dynamics.
560. **The Family Institution.** (2:2:0) S. Christiansen  
Emphasizes the family in several different societies and problems created by various family systems.
561. **Contemporary Sociological Research.** (2:2:0) S. (m) (Offered 1970-71 and alternate years)
570. **Class, Status, and Power.** (3:3:0) F. Prerequisite: Sociol. 111. Duke, Seggar  
Analyzes the major status and class systems in various societies. Also discusses power relations in such systems.
571. **Latin-American Social Change.** (3:3:0) F.S.Su. (m) Prerequisite: Sociol. 111 or 112 or consent of instructor. Craig, Spencer  
Analysis of contemporary Latin-American urban and rural social structure and the processes of social change in modernization in Latin America.

- 572. Rural Social Development in Latin America.** (3:3:0) S. (m) Prerequisite: Sociol. 111 or 112 or consent of instructor. Craig, Spencer  
Study of contemporary peasant and Indian society; variables impeding and effecting social changes; strategies and skills of planned change in private and public social change programs.
- 580. Medical Sociology.** (3:3:0) F. (m) Prerequisite: Sociol. 111 or Psych. 111. Condie  
Analyzes the structure of medical and health organizations and the social roles of the patient, the physically disabled, and the medical practitioner.
- 590. Seminar in Criminal Behavior Systems.** (2:2:0) F.S.Su. (m) Prerequisite: Sociol. 380. Smith, Symons  
A study of the research and theory concerning criminal typologies; a diagnostic course to complement Sociol. 591 which deals with contemporary corrections.
- 591. Seminar in Crime Causation and Treatment.** (2:2:0) F.Su. (m) Prerequisites: Sociol. 111, 380. Smith, Symons  
Considers the major causes of crime and analyzes prevalent theory and techniques of treatment of criminals.
- 595. Directed Readings.** (1-3:0:2-6) F.S.Su. (m)  
Readings in special areas.
- 596. Directed Readings.** (1-3:0:2-6) F.S.Su. (m)  
Readings in special areas.
- 597R. Advanced Research Methods.** (3:3:0 ea.) S. Prerequisite: Sociol. 397. Brinkerhoff, Peterson  
Analyzes methods used in investigation of sociological data. Field projects give the student actual experience in research.
- 623. Demographic Analysis.** (3:3:0) S. Prerequisite: Sociol. 420.  
The discipline of demography, with its special methods and procedures, will be analyzed. Major current research in the field will receive careful coverage.
- 626. Contemporary Urban Social Structure.** (3:3:0) S. Prerequisite: Sociol. 426 or consent of instructor. Staley  
This course will be a research-oriented examination of social forces in contemporary urban life which influence patterns of human interaction.
- 630. (Sociol.-Psych.) Attitude Change.** (3:3:0) F. Prerequisite: graduate standing or consent of instructor. Blake, Kunz  
An examination of various theoretical approaches to the study of attitude development, change, and assessment, including a focus of both individual and mass persuasion.
- 660. Familial Role Structure.** (3:3:0) S. Prerequisite: Sociol. 403. Bradford, Kunz  
Analysis of the various roles in the family, with their attendant characteristics and problems, in various societies, but particularly in the United States.
- 671. Problems in Latin-American Social Development.** (2:2:0) F.S.Su. (m) Prerequisite: graduate standing. Craig, Spencer  
Examination of significant social problem areas: migration, land tenure, population, education, religion, colonization, labor organization, peasant movements, programmed change, social mobility, etc.
- 686. Problems in Race Relations.** (2:2:0) F. Staley  
Considers significant problems of a specialized nature in the field of race relations.
- 690. Seminar in Contemporary Sociological Theory.** (2:2:0) F.Su. Prerequisites: Sociol. 404, 405. Bradford, Duke, G. De Hoyos, Spencer, Staley  
An advanced course in sociological theory.

- 691. Seminar in Sociological Theory Building.** (2:2:0) S. Prerequisites: Sociol. 404, 405, and 690. Bradford, Duke, Peterson  
An advanced course in sociological theory building.
- 692. Seminar in Problems of Rural Society.** (3:2:1) F. Prerequisite: Sociol. 423 or consent of instructor. Christiansen, Spencer  
Field-type training, with on-the-job contacts with county agents, etc. Findings from these contacts will be the classroom material.
- 693. Seminar in Sociology of the Family.** (2:2:0) F.S.Su. (m) Prerequisite: Sociol. 403. Kunz, Peterson  
Comprehensive analysis of sociology of the family with special emphasis on current research, theoretical models, and research techniques employed.
- 694. Directed Research.** (1-3:0:2-6) F.S.Su.  
Research in special areas.
- 696. Seminar in Industrial Sociology.** (3:3:0) Prerequisite: Sociol. 446.  
Designed to give added insight by careful attention to current trends in industry, labor-management developments, government, participation, etc.
- 697R. Seminar in Survey Research.** (3:3:0 ea.) S. (m) Prerequisites: Sociol. 397 or equivalent; graduate standing in sociology or allied discipline. Peterson  
Analysis of survey research as a specific research technique of the behavioral sciences with emphasis on survey research designs and sampling designs.
- 698. Seminar in the Development of Sociological Theory.** (2:2:0) F. Prerequisite: Sociol. 404, 405. Duke  
Analyzes contributions of sociological theorists, including Durkheim, Weber, Pareto and Simmel, to sociological theory development.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.
- 701. Advanced Statistical Methods.** (2:2:0) S. Prerequisites: Sociol. 320, 524.  
Consideration of advanced statistical techniques such as scalogram analysis, factor analysis, and latent structure analysis.
- 760. The Family.** (3:3:0) (m) Prerequisite: Sociol. 560. Bradford  
This course analyzes the family as a basic organization in society. It concentrates on family structure in various cultures.
- 791. Seminar: Social Organization.** (2:2:0) F. Prerequisites: Sociol. 111, 405. G. De Hoyos  
Comprehensive examination of major theories of organization with emphasis on theory construction.
- 792. Seminar: Social Psychology.** (2:2:0) S. Prerequisites: Sociol. 350, and consent of instructor. Blake, Kunz, Larsen  
Designed to give advanced work to graduate students. Gives special emphasis to group processes and socialization.
- 796, 797R. Special Research Problems.** (1-3:0:2-6 ea.) F.S.Su.
- 799. Dissertation for Ph.D.** (Arr.) F.S.Su.

## Speech and Dramatic Arts

**Professors:** Bateman, Clinger, Gledhill, Hansen, Low, Mitchell, Morley, Newman (chairman, D-581-D HFAC), Woodbury.

**Associate Professors:** Metten, Moore.

**Assistant Professors:** Gibb, Oaks, Pope, Whitman.

### Communicative Disorders

The Department of Speech and Dramatic Arts offers a program leading to the Master of Communicative Habilitation and the Master of Science degree with

emphasis in either speech pathology, audiology, or communication science; and professional certification in speech pathology and audiology, or education of the partially hearing. It is expected that the graduate student in this area will meet all general requirements for advanced degrees as outlined by the Graduate School. Special departmental and area requirements are given below.

### Dramatic Arts

The department offers a program leading to the Master of Arts degree in the area of dramatic arts with emphasis in history, acting, directing, interpretation, technical theatre, or playwriting, and a program leading to the Doctor of Philosophy degree in the area of dramatic arts with emphasis on directing, playwriting, interpretation, or criticism.

It is expected that the graduate student in dramatic arts will meet all general requirements for advanced degrees as outlined by the Graduate School. Special departmental and area requirements are given below.

### Speech

The department offers a program leading to the Master of Arts degree in the area of speech and a program leading to the Doctor of Philosophy degree in speech and dramatic arts with an emphasis in rhetorical theory or general speech and forensics.

It is expected that the graduate student in speech will meet all general requirements for advanced degrees as outlined by the Graduate School. Special departmental and area requirements are given below.

### Admission

General University admission requirements listed in the forepart of this catalog are to be followed. Admission to full graduate standing in the department requires the student to present an acceptable undergraduate background which must be approved by the department chairman. Undergraduate courses may be required for those students whose background is not sufficiently related to his graduate major. The student must also pass a written examination during the first semester of study to demonstrate proficiency in the area in which he intends to major.

### Master of Arts Degree

The requirements for the Master of Arts degree may be completed under Option I (with a minor in a related field) or Option II (with other related course work substituted for a minor). The candidate also has the option of working under a thesis or nonthesis program. The candidate for the thesis program is required to complete a minimum of thirty hours of which a minimum of fifteen hours must be in the major area and a minimum of nine hours in a minor field or related course work, and he must submit an acceptable thesis. The candidate for the nonthesis program is required to complete a minimum of twenty-four hours in the major area, a minimum of twelve hours in a minor area, and electives for a total of forty hours. Speech and Dram. Arts 690 is required of all degree-seeking students.

The candidate for the nonthesis degree must also successfully complete a written comprehensive examination near the end of his course work. Under the direction of the chairman of his committee, the candidate must also complete a scholarly paper or monograph outside of regular class research. In the area of dramatic arts the written examination will cover the following areas at the discretion of the advisory committee: playwriting, design for the stage, lighting, costume design, technical production, theatre-business-management, acting, directing, theatre history, dramatic literature, and dramatic theory and criticism. In the area of speech the comprehensive examination will cover rhetorical theory and the courses included in the student's program approved by his advisory committee. The student should be familiar with the history of rhetoric and

public address along with its practical application in educational and forensic areas.

### **Master of Science Degree**

The requirements for the Master of Science degree may be completed under Option I (with a minor in a related field) or Option II (with other related course work substituted for a minor). The candidate for the Option I program is required to complete a minimum of thirty-four semester hours of which a minimum of twenty-three hours must be in the major area and nine hours in related course work. The following courses including thesis are required under both options: Stat. 552, Speech and Dram. Arts 630, 680R or 681R, 699, and ten semester hours of 500- and 600-level Speech and Dram. Arts courses in communicative disorders.

Suggested minors under Option I are special education, psychology, counseling and guidance, child development, educational administration, physiology, linguistics, sociology, etc. Related course work under Option II may be selected from approved courses in communicative disorders, special education, psychology, counseling and guidance, etc.

### **Master of Communicative Habilitation**

The requirements for the Master of Communicative Habilitation are similar to those of the Master of Science with the following exceptions. No thesis is required. In its place the Master of Communicative Habilitation degree requires one semester hour of 644R, for which credit the student prepares a comprehensive paper on a professional topic approved by the advisory committee. It also requires five or six additional credits in professional courses as approved by the advisory committee.

### **Doctor of Philosophy Degree**

In addition to the general Graduate School requirements for the Doctor of Philosophy degree, the speech and dramatic arts student is required to satisfy the following departmental requirements:

1. A minimum of forty-five hours of approved graduate course work in the major field including Speech and Dram. Arts 690.
2. A minimum of fifteen hours of approved graduate course work in the minor area of specialization.
3. The major area emphasis and minor area are selected in consultation with the candidate's advisory committee. As a part of these major and minor requirements, the student must complete a minimum of six hours in Speech and Dram. Arts 797R, and a minimum of eighteen hours in Speech and Dram. Arts 799, and present an acceptable dissertation. The program requires a minimum of six semesters of full-time study beyond the bachelor's degree.
4. The general equivalent of two of the six semesters, or one academic year, is to be devoted to original research culminating in the dissertation. Three kinds of dissertation research will be accepted: (1) scholarly analysis of history, theory, and criticism; (2) research and strong creative achievement in playwriting and theatrical production; and (3) measurement studies.

A detailed list of requirements may be obtained from the office of the chairman of the department.

Following are the courses which fall in the

1. Dramatic arts area of emphasis:  
560R, 564, 565, 572, 578R, 667, 668, 670, 671, 672, 673, 674R, 675, 676, 678, 690, 695, 697R, 699, 731, 732, 733, 740, 772, 773, 797R, 799.
2. Interpretation area of emphasis:  
423R, 527, 660, 661, 663, 667, 690, 695, 696, 699.

3. Speech area of emphasis:  
 521, 523, 525, 527, 590, 601, 621, 622, 623, 624, 690, 691, 692, 693, 694,  
 699, 797R, 799.

### Courses

- 521. History of Speech Education.** (2:2:0) S. Frost  
 Theories, practices, and techniques in the teaching of speech from the Greco-Roman period through the elocutionary period.
- 523. Rhetorical Theory.** (2:2:0) F. (Su. even years) (m) Bateman, Gibb  
 A study of rhetorical theory and criticism of great speaking.
- 525. Debate Coaching.** (1-2:1-2:0) F.S.Su. Richardson
- 527. Storytelling.** (2:2:0) F.S.Su. (m) Clinger, Frost  
 Art of storytelling. Especially valuable to teachers and youth leaders.
- 528 Repertory Theatre.** (3:2:6) F.S. Prerequisite: consent of instructor.  
 Theory and practice in repertory theatre.
- 529. Repertory Theatre.** (3:2:6) F.S. Prerequisite: consent of instructor.  
 Theory and practice in repertory theatre.
- 560R. Theatre Workshop.** (2-4:2-4:2 ea.) F.S.Su.  
 Integration in production of theatre's individual arts: literature, directing, acting, and stagecraft.
- 564. Theatre History I.** (3:3:0) F. (Su. odd years) Hansen  
 The history of the theatre: Primitive, Egyptian, Greek, Roman, Medieval, and Elizabethan periods.
- 565. Theatre History II.** (3:3:0) S. (Su. even years) Metten, Woodbury  
 The history of the Western and Oriental theatres: Renaissance to the present.
- 572. Children's Theatre.** (2:2:1) F.S. Mitchell, Whitman  
 Theory and technique of creating theatre for children.
- 578R. Playwriting.** (1-2:1-2:0 ea.) F.S. Hansen, Whitman  
 Theories and techniques of conceiving and expressing experience as dramatic literature.
- 590. Selected Readings and Projects in Public Address.** (1-2:0:0) F.S.Su.  
 Opportunity for expression of independent research and experimental work in special reading and public address projects over and beyond or outside of usual thesis work.
- 601. Psychology of Public Address.** (2:2:0) S. (Su. odd years) Prerequisites: Speech and Dram. Arts 101, 401 or 403. Gibb, Stephen  
 Advanced study of the psychological elements connected with audience thinking and style of speaking and composition commensurate with persuasion.
- 621. Ancient Rhetoric and Oratory.** (3:3:0) F. (Su. odd years) Stephen  
 History and development of rhetorical principles in the classical world, with reference to the works of Socrates, Plato, Aristotle, Cicero, Quintilian, and others. Analysis of selected speeches from the periods.
- 622. British Public Address.** (3:3:0) S. (Su. even years) Stephen  
 Historical and critical study of significant speakers and speeches and of their relationship to British political and social life.
- 623. American Public Address.** (3:3:0) F. (Su. even years) Bateman  
 Historical and critical study of significant speakers and speeches and of their relationship to American political, social, and intellectual life—from colonial times to the midtwentieth century.

- 624. Contemporary Public Address.** (3:3:0) S. (Su. odd years) Bateman  
 Historical and critical study of significant speakers and speeches in post-World War II society. Special attention to contemporary modes of communication and trends in rhetorical analysis.
- 630. Methods and Problems of Research in Communication Disorders.** (2:2:0) F.S.Su.  
 K. Jones, Weaver  
 A practical study of the methods of scientific inquiry as applied to the disorders of communication. It is imperative that students take this course early in their graduate program to prepare them for their thesis projects.
- 631. Seminar in the Generation and Perception of Acoustic Stimuli.** (2:2:0) S.  
 Prerequisites: Speech and Dram. Arts 430, 431. K. Jones, Weaver  
 An advanced study made of the acoustics of speech sounds and their perception by the ear and mind of the listener. Current research in experimental phonetics reviewed.
- 632. Dynamics of Human Communication.** (2:2:0) F. (Su. even years) Newman  
 A study of the dynamics of intra- and interpersonal communication. The human factors of personality, learning, motivation, cognition, etc., are considered from the perspective of human communication.
- 640. Stuttering.** (2:2:1) S. (Su. even years) Newman  
 Evaluation and treatment of stuttering are studied. Its development and current theories of etiology are also reviewed.
- 641. Advanced Diagnosis of Communication Disorders.** (2:2:1) F.S.Su. Pre-requisite: Speech and Dram. Arts 441. Low  
 Diagnosis of communication disorders. Evaluation and appraisal of the human communication systems including assessment of sensory inputs (their perceptual, conceptual, and higher functions), expressive components and their feedback relations.
- 642. Voice Disorders.** (2:2:1) S. (Su. even years) D. Jones  
 Emphasis is placed upon the organic voice disorders. Etiological factors are identified. Diagnosis and treatment procedures are studied and practical demonstrations are given.
- 643. Communication Disorders of the Cerebral Palsied.** (2:2:1) F. Prerequisite: Speech and Dram. Arts 431. Jex  
 Study of the incidence, etiology, appraisal, and procedures for speech and hearing therapy of the cerebral palsied.
- 644R. Special Problems in the Communicative Disorders.** (1-3:1-3:0 ea.) F.S.Su.  
 Prerequisite: consent of instructor.  
 Individual study in depth in the clinical or applied areas.
- 646. Oro-Facial Communication Disorders.** (2:2:1) F. (Su. odd years) Prerequisite: Speech and Dram. Arts 430, 431. Newman  
 Study of communication disorders associated with anomalies of palate, teeth, tongue, maxilla, and mandible.
- 647. Communication Disorders of the Mentally Retarded.** (2:2:1) S. (Su. odd years) Prerequisite: Speech and Dram. Arts 431. Low  
 Advanced studies of the communication disorders of the mentally retarded. Principles and procedures of communication habilitation. Designed for speech and hearing and special education majors and other school specialists.
- 648. Aphasia.** (2:2:1) S. (Su. odd years) Prerequisite: Speech and Dram. Arts 431. Low  
 Nature, etiology, diagnosis, and therapy associated with the speech of child and adult aphasics (brain damaged) will be studied; also linguistic, behavioral, and intellectual changes.

- 650. Clinical Audiology.** (2:2:2) F. (Su. odd years) Prerequisite: Speech and Dram. Arts 351. Weaver  
The theoretical bases and development of skill in the techniques of administering new and advanced audiometric procedures in the assessment of impaired hearing.
- 651. Community and Industrial Audiology.** (2:2:1) S. Prerequisite: Speech and Dram. Arts 351. Weaver  
Study of hearing problems in industry, legal implications, hearing, testing of adults, and adult hearing rehabilitation.
- 652. Pediatric Audiology.** (2:2:1) S. Prerequisite: Speech and Dram. Arts 351. Moore  
Intensive study of the problems encountered and the audiological instruments used in assessing the hearing of infants and young children.
- 653. Hearing Aids and Instrumentation.** (3:3:0) F. (Su. even years) Prerequisite: Speech and Dram. Arts 351. Weaver  
Designed to acquaint students in speech, hearing, and related fields with basic designs, operation, selection, and use of hearing aids of all types for individuals with impaired hearing.
- 656. History, Education, and Guidance of the Hearing Impaired.** (2:2:0) F. Prerequisites: Speech and Dram. Arts 130; Ed. 260.
- 657. Teaching Speech to the Hearing Impaired.** (2:2:2) S. Prerequisites: Speech and Dram. Arts 130, 231. Moore
- 660. Theory of Interpretation.** (2:2:0) F. (Su. odd years) Prerequisites: Speech and Dram. Arts 121, 123, 325, or equivalent. Gledhill, Golightly  
Study of the theories of Plato, Aristotle, Horace, Quintilian, Longinus, Bulwer, and Burgh relevant to the art of oral interpretation, and of the theories of Sheridan, Walker, and later writers who continued such analyses.
- 661. Oral Interpretation of Classical Literature.** (2:2:0) S. Prerequisites: Speech and Dram. Arts 121, 123, 325 or equivalent. Metten, Woodbury  
Analysis of the classic forms of poetry, and of the interpretation theories and techniques appropriate to their artful performance.
- 663. Program Building and Lecture Recital.** (2:2:0) S. Prerequisites: Speech and Dram. Arts 121, 123, 325, or equivalent. Gledhill, Metten  
Theory and practice in the structuring of literary excerpts into formal lecture recitals.
- 667. History of Acting.** (2:2:0) (S. even years) Prerequisite: Speech and Dram. Arts 423R. Woodbury  
The history of acting theories and their implementation from classic until modern times.
- 668. Special Studies in Theatre History.** (1-3:1-3:0) F.S.  
Supervised research in selected historical problems.
- 670. Advanced Theory and Practice in Technical Theatre Production.** (2:2:0) S. Prerequisites: Speech and Dram. Arts 319, or 320, or 675, or consent of instructor. Hansen  
Analysis and application of design theory for the nonrealistic theatre.
- 671. Experimental Theatre.** (2:2:0) F. Prerequisites: Speech and Dram. Arts 460, 461R, or equivalent. Hansen  
Theory and practice in directing nonconventional dramatic literature.
- 672. Problems of the Producing Director.** (2:2:0) F. Hansen  
Supervised research in the social and economic problems of producing theatre art: budgeting, programming, consumer analysis, social responsibilities.

- 673. Advanced Play Production—Directing.** (2:2:0) S. (Su. even years) Prerequisite: Speech and Dram. Arts 460 or equivalent. Woodbury  
An advanced study of theories and techniques.
- 674R. Projects in Theatre.** (1-4:1-4:0 ea.) F.S.Su.  
Supervised applied theory in playwriting, directing, acting, and stagecraft.
- 675, 676. Stage Design.** (2:2:1 ea.) F.S. Prerequisites: Speech and Dram. Arts 319 or 320, or equivalent. Henson, Pope  
Advanced theory and techniques of scenic design.
- 678. Stage Lighting.** (1-2:1-2:0) F.Su. Prerequisites: Speech and Dram. Arts 319 or 320, or consent of instructor. Pope, Struthers  
Advanced theory and techniques of theatrical lighting.
- 680R. Internship Practicum in Speech Pathology.** (1-2:0:4 ea.) F.S.Su.
- 681R. Internship Practicum in Audiology.** (1-2:0:4 ea.) F.S.Su.
- 690. Methods and Problems of Research in Speech and Dramatic Arts.** (2:2:0) F. (Su. even years)  
Required of all graduate students. It is imperative that students take this course during their first semester.
- 691. Research in Oral Communication: The Historical-Critical Approach.** (2:2:0) F. Bateman
- 692. Research in Oral Communication: The Quantitative Approach.** (2:2:1) S. Gibb
- 693. Seminar in Persuasion.** (1-3:1-3:0) F. (Su. even years) Gibb, Stephen  
In-depth analysis of persuasion theory—from the classical theorists to contemporary trends.
- 694. Seminar in Public Address.** (1-3:1-3:0) S. (Su. odd years)  
Bateman, Stephan  
Analysis and evaluation of the research and publications in public address.
- 695. Seminar in Reader's Theatre.** (1-3:1-3:Arr.) S. (Su. even years) Gledhill  
Theory and practice of editing, directing, and dramatizing exclusively for reader's theatre.
- 696. Seminar in Interpretation.** (1-3:1-3:0) F. (Su. even years) Gledhill, Metten  
Supervised research and analysis of advanced interpretation techniques.
- 697R. Seminar in Arena Theatre.** (1-4:1-4:0 ea.) S. (Su. odd years) Hansen  
Theory and practice of editing, directing, and dramatizing exclusively for the arena theatre.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su.
- 731. Dramatic Theory and Criticism I.** (3:3:0) F. (Su. odd years) Metten  
The history and principles of dramatic theory and criticism from Plato to Lessing.
- 732. Dramatic Theory and Criticism II.** (3:3:0) S. (Su. even years) Metten  
The history and principles of dramatic theory and criticism from Lessing to Langer.
- 733. Dramatic Theory and Criticism III.** (3:3:0) S. (Su. odd years) Hansen  
A study and analysis of the major dramatic forms: tragedy, comedy, melodrama, farce.
- 740. Seminar in the Theory and History of Theatrical Costuming.** (2:2:1) S.Su.
- 772. Directing and Staging I.** (3:3:0) F. (Su. even years) Prerequisite: Speech and Dram. Arts 673. Woodbury  
Theory and technique of directing and staging historical and period plays: Greek, Roman, Medieval, Elizabethan, Restoration, and Continental plays before 1841.

- 773. Directing and Staging II.** (2:2:0) S. (Su. odd years) Woodbury  
 Theory and technique of directing and staging plays from the modern and abstract repertoire: Expressionism, Constructivism, Epic, Romanticism, Absurd, Oriental, Cruelty, Happenings.
- 797R. Research.** (1-6.Arr.:Arr. ea.) F.S.Su.
- 799. Dissertation for Ph.D. Degree.** (Arr.) F.S.Su.

## Statistics

**Professors:** Carter (graduate coordinator, 210 MSCB), Nielson, Richards.

**Associate Professors:** Faulkner, Hilton (chairman, 206 MSCB).

**Assistant Professors:** Beus, Rencher.

The Department of Statistics offers courses leading to the Master of Science degree in statistics for students who are (1) preparing for work in industry or government, or (2) preparing for additional study and research in statistics at the Ph.D. level.

### Requirements

The graduate student is expected to satisfy all the general requirements for a Master of Science degree outlined by the Graduate School.

A student will be required to complete twenty-four approved semester hours exclusive of thesis of which a minimum of eighteen hours must be in the Department of Statistics. If advanced calculus has not previously been completed, the above twenty-four hours must include three hours of advanced calculus. Students should have at least completed mathematics through integral calculus before entering the program. Those failing to meet this requirement can expect to take more time in completing the degree requirements.

Statistics 501 is available for those students with no previous training in statistics and may be completed during the summer preceding enrollment. This course will not count toward a degree. The student must include 621 and 636 in his program, and have credit in 591 for each semester in residence.

A statistics minor at the master's level shall consist of nine hours of course work numbered 300 and above, except 552. A minor at the doctoral level shall consist of 421, 422, and nine additional hours from courses numbered 433 and above, except 501, 552, 554.

### Courses

- 501. Statistics for Research Workers I.** (5:4:3) F.S.Su. Prerequisite: Math. 105 or equivalent. Beus, Carter, Hilton  
 Probability, estimation, confidence intervals, tests of hypotheses, regression, and analysis of variance. Designed for graduate students in the natural or social sciences.
- 502. Statistics for Research Workers II.** (5:4:3) F.S. Prerequisite: Stat. 501 or equivalent. Beus, Carter, Hilton  
 Analysis of covariance, multiple regression, linear models, experimental design, nonparametric methods, and sampling. Designed for graduate students majoring in the natural or social sciences.
- 511. Application of Computers to Statistical Problems.** (3:3:3) F. Prerequisites: Stat. 336 or 501. Carter, Crandall  
 Application of computers to analysis of variance and covariance, multiple regression, factorial experiments, Monte-Carlo simulation, unequal cell frequencies. For natural or social science students.

- 522. Theory of Linear Models.** (3:3:0) S. Prerequisites: Stat. 421 and concurrent registration in Stat. 422. Nielson, Rencher, Richards  
A study of generalized linear hypotheses with application to regression and experimental design.
- 531. Experimental Design.** (3:3:0) F. Prerequisites: Stat. 330, 336, or 501. Carter, Hilton  
Randomized blocks, Latin squares, factorial designs, fractional replication, confounding and incomplete blocks.
- 534. Sampling.** (3:3:0) F. Prerequisite: Stat. 336 or equivalent. Nielson  
Systematic, simple random, stratified and cluster sampling; optimum allocation; ratio estimation, etc. Applications to various fields.
- 536. Regression Analysis.** (3:3:0) S. Prerequisite: Stat. 336 or 501. Carter, Rencher  
Applications of multiple regression, introduction to model building, examination of residuals, stepwise regression procedures, introduction to nonlinear estimation.
- 541. Advanced Probability.** (3:3:0) S. Prerequisite: Math. 214. Recommended: completion of or concurrent registration in Stat. 421. Burton, Faulkner  
Recurrent events, runs and sequences, advanced combinatorial methods, random walk, queuing and Monte-Carlo methods; introduction to Markov chains and sequential processes.
- 552. Statistical Methods in Education I.** (3:3:0) F.S.Su. Prerequisite: consent of instructor. Hendrix  
Measures of central tendency, variability and linear correlation. Introduction to probability and statistical inference using normal, t, and chi-square distributions. Computer usage stressed. For majors in education and related fields.
- 554. Statistical Methods in Education II.** (3:3:0) F.S.Su. Prerequisite: Stat. 552. Hendrix  
Educational application with the computer of analysis of variance and covariance, multiple and partial regression and correlation, nonparametric methods. Introduction to experimental design.
- 591R. Graduate Seminar in Statistics.** (½:1:0 ea.)
- 621, 622. Advanced Theory of Statistics I, II.** (3:3:0 ea.) F.S. Prerequisites: Math. 541; Stat. 422. Recommended: Stat. 522. Faulkner, Nielson, Rencher  
Advanced topics in the theory of estimation, testing hypotheses, multiple regression, multivariate analysis.
- 623. Analysis of Variance.** (3:3:0) F. Prerequisites: Stat. 422, 522 or equivalent. Nielson, Richards  
Theory of analysis of variance for fixed effects, random effects and mixed models including two-three and higher-way layout, Latin squares, incomplete blocks and nested designs.
- 631. Advanced Experimental Design.** (3:3:0) S. Prerequisites: Stat. 422, 531. Recommended: Stat. 522. Carter, Nielson  
Advanced topics in experimental design including the general p-level factorial, Youden squares, balanced incomplete blocks, response surfaces, lattice design.
- 632. Advanced Industrial Statistics and Reliability.** (3:3:0) S. Prerequisites: Stat. 422, 432 or equivalent. Richards  
Advanced topics in sequential sampling, tolerance limits, life testing and reliability.
- 636. Advanced Statistical Methods.** (3:3:0) F. Prerequisites: Stat. 336, 422, and/or 501. Carter, Richards  
Advanced topics in estimation, confidence intervals, tests of hypotheses including distribution-free methods, truncated distributions, order statistics.

- 641. Advanced Topics in Probability I.** (3:3:0) F. Prerequisites: Math. 542, Stat. 422, 541. Burton, Faulkner Advanced topics in Markov chains, Stochastic processes and information theory.
- 642. Advanced Topics in Probability II.** (3:3:0) S. Prerequisites: Math. 542, Stat. 541, 621. Recommended: Stat. 641, Math. 641. Burton A measure theoretic approach to probability including Borel sets, characteristic functions, measure spaces, measurable functions.
- 690R. Special Topics in Statistics.** (3:3:0 ea.) F.S.Su. Prerequisite: consent of instructor. Specialized topics in statistics varied from time to time.
- 695. Reading in Statistics.** (1-2:1-2:0) F.S.Su. Prerequisite: consent of department.
- 699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) F.S.Su. Prerequisite: consent of department.

## Zoology

**Professors:** Allen, Allred, Chapman, Frost, Hayward (emeritus), Murphy (chairman, 575-A WIDB), Nicholes, V. Tanner (emeritus), W. Tanner, Wood.

**Associate Professors:** Andersen (graduate coordinator, 155 WIDB), Heninger, Jaussi, Jorgensen, Tipton.

**Assistant Professors:** Bradshaw, Braithwaite, Farmer, Nyberg, Smith, C. White, D. White, Whitehead.

### Graduate Degrees

The Department of Zoology offers course work and training leading to the Master of Science and Doctor of Philosophy degrees. A student may specialize in one of the major disciplines of graduate research listed below. In addition to his major field of study, he must select one minor field in another academic department, or a systematic group of supporting and related courses in other departments. A second minor also may be selected; it may be in another department or it may be one of the disciplines in the Department of Zoology related to his major. At the discretion of his advisory committee, the student may be required to participate in extended periods of off-campus field or laboratory training as a prerequisite for the M.S. or Ph.D. degree.

### Disciplines of Graduate Research

The Department of Zoology is housed in the new multistory John A. Widtsoe Building in which modern laboratories and equipment, including a laboratory of marine aquaria, are available for research in many disciplines. In addition, University-owned study sites and other natural areas ranging from desert to arctic-alpine habitats, with freshwater streams and lakes, are in close proximity to the campus.

A student may perform research in broad or specific aspects of such disciplines as anatomy, ecology, genetics, molecular biology, physiology, taxonomy, or zoogeography. Where applicable, he may specialize with a particular group of animals in areas of invertebrate or vertebrate zoology.

### General Requirements

A student is expected to satisfy all general requirements for an advanced degree as outlined by the Graduate School; the responsibility for compliance rests with the student. His advisory committee, composed of members representing his major and minor subjects, will counsel and guide him during the entire period of his graduate studies and report unsatisfactory progress to the depart-

ment graduate coordinator. As early as the end of his first semester and no later than the end of the second, the student will be informed of his degree-seeking status in the Department of Zoology, and such recommendations as are necessary will be sent to the dean of the Graduate School.

Each graduate student who majors in the Department of Zoology must register for graduate seminar 696R during each semester of residence unless specifically excused by the chairman of his advisory committee, and must complete Zool. 521 and 620. A student who elects to obtain a minor in zoology is required to take at least six semester hours taught in the Department of Zoology at BYU. These hours are in addition to credit transferred from another accredited university which are to be considered as part of his graduate program.

#### **Foreign Language Requirement**

Every Ph.D. applicant in the Department of Zoology must select one of the three following options (I, II, or III) in consultation with his advisory committee:

- I. Two-language requirement, to be fulfilled by:  
Passing the ETS examination in two of four languages—French, German, Russian, or Spanish;
  - or, Completion of course numbers 95 and 96 in two languages in those departments (French, German, and Spanish) where these examinations are given, with a passing grade in course number 96;
  - or, A combination of a passing score in the ETS examination in one language, and a passing grade in course number 96 in the second language.
- II. One language plus a core of courses in an area beneficial to a student in zoology, to be fulfilled by:  
Completion of one language by passing the ETS examination or by receiving a passing grade in course number 96, plus selected courses approved by the student's advisory committee in one or more of the following departments:  
Computer Science—nine or more semester hours including course number 331 and above.  
or, Mathematics—nine or more semester hours including course number 112 and above.  
or, Statistics—nine or more semester hours including course number 502 and above.
  - III. One language in depth:  
Under this provision only French, German, or Russian may be used. To satisfy this requirement the student must pass an examination in depth administered by the BYU Language Department, or complete courses 321, 415, and 416 or their equivalents in the specific language with grades of "B" or better.

#### **Application for Admission**

A graduate student applying for admission to Brigham Young University must complete the admission requirements as described in the General Information section of the Graduate Catalog. The following deadlines will be observed relative to admission to the Department of Zoology.

<b>Admission for Fall Semester</b>	<b>Admission for Spring Semester</b>
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**A student must file the results of both sections of the Graduate Record Examination and all completed forms, transcripts, and letters of recommendation with the Graduate School.**

Feb. 1

Oct. 1

**Review of applications for admission and teaching assistantships to be completed by the Department of Zoology, and recommendations sent to the Graduate School and student, respectively.**

Mar. 1 Nov. 1

**Notification sent by the student to the Department of Zoology graduate coordinator indicating intent to enroll.**

Apr. 15 Dec. 15

Application forms for teaching assistantships may be obtained from the chairman of the Department of Zoology. Deadlines for receipt of teaching assistantship applications are February 1 for Fall Semester, October 1 for Spring Semester, and March 1 for Summer Semester. Final appointment of a graduate teaching assistant is contingent upon his acceptance as a provisional or full degree-seeking student by the Department of Zoology.

#### Schedule of Special Examinations at BYU

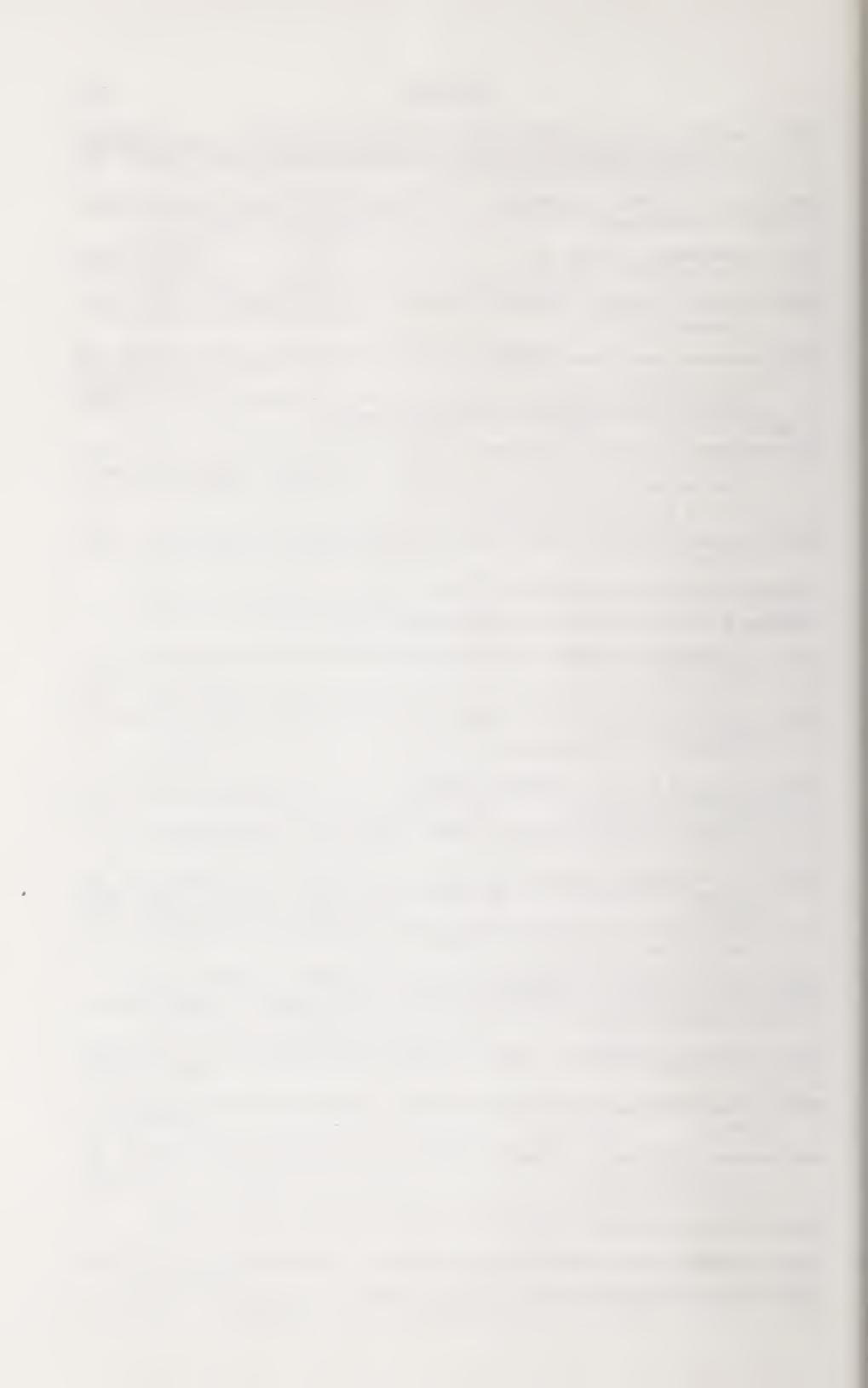
1. Written departmental entrance examination—during first semester in residence. (Not required for a Ph.D. candidate who has received an M.S. degree from the Department of Zoology at BYU within three years prior to his registering as a provisional or full degree-seeking student.)
2. Qualifying oral examination (for M.S. candidates only)—prior to registration of last semester in residence.
3. Comprehensive written and oral examinations (for Ph.D. candidates only)—after completion of the foreign language requirement, but not earlier than the beginning of the last semester of required course work.
4. Defense of thesis or dissertation—not later than three weeks before graduation.

#### Courses

517. **Experimental Parasitology.** (3:2:3) S.(Offered 1971-72 and alternate years) Prerequisite: Zool. 317 or 417. Andersen, Nyberg
520. **Research Organization and Reporting.** (1:1:1) F.S. Allred
521. **Zoological Literature.** (2:2:0) F. Wood  
Literature of zoology applicable to research and writing. Formerly Zool. 510.
- Botany 522. Biological Instrumentation.** (3:1:6)
- Botany 525. Ultrastructural Interpretation.** (3:3:0)
530. **Insect Classification.** (4:1:6) S. Prerequisite: Zool. 430. Wood  
Principles of animal classification with emphasis on insects. Formerly Zool. 332.
531. **Internal Morphology and Physiology of Insects.** (4:2:6) S. (Offered 1970-71 and alternate years) Prerequisites: Zool. 430; Chem. 151 or 351. Whitehead  
Formerly Zool. 330 (part) and 531.
534. **Economic Entomology.** (3:2:2:) S. Prerequisite: Zool. 331. Jorgensen  
Formerly Zool. 334.
535. **Medical Entomology.** (2:1:2) F. Prerequisite: Zool. 331. Recommended:  
Micro. 331. Tipton  
Arthropods which affect the health of man and domestic animals.  
Formerly Zool. 433.
538. **Immature Insects.** (2:0:4) S. (Offered 1971-72 and alternate years) Wood

- 543. Ichthyology.** (2:2:2) F. Prerequisite: Zool. 203. White  
The anatomy, classification, and ecology of the fishes. Formerly Zool. 343.
- 545. Herpetology.** (2:1:2) S. Prerequisite: Zool. 203. Tanner  
The classification, distribution, ecology, and natural history of reptiles and amphibians. Formerly Zool. 345.
- 546. Ornithology.** (2:1:2) S. Prerequisite: Zool. 203. Frost  
The classification, field and laboratory identification, and natural history of birds. Formerly Zool. 346.
- 547. Mammalogy.** (2:2:2) F. Prerequisite: Zool. 203. Smith  
Formerly Zool. 347.
- 551, 552. Population Ecology I, II.** (2:1:3 ea.) F.S. Prerequisite: Zool. 451; concurrent registration in or completion of Stat. 501 and 502 or equivalents. Jorgensen  
Principles of population ecology and methods of research. Field trips scheduled five Saturdays.
- 556. Limnology.** (3:2:2) F. Prerequisite: Zool. 451 or equivalent. White  
Interactions of biota within freshwater systems. Field trips scheduled four Saturdays. Formerly Zool. 540.
- 561. Advanced Vertebrate Anatomy.** (3:1:4) F. (Offered 1970-71 and alternate years) Prerequisite: Zool. 363. Tanner
- 565. Endocrinology.** (3:3:0) S. Prerequisite: Zool. 465 or equivalent. Heninger, Jaussi
- 566. Experimental Endocrinology.** (2:0:6) S. Prerequisite: Zool. 465. Heninger, Jaussi  
Experiments selected to familiarize students with techniques used in research.
- 574. Molecular Biology.** (3:3:0) S. Prerequisites: Chem. 581; course in genetics. Farmer  
Molecular basis of physiology with emphasis on cellular control systems and biochemical genetics.
- 576. Human Genetics.** (3:3:0) S. (Offered 1970-71 and alternate years) Prerequisite: Zool. 376 or Bot. 376. Bradshaw  
Genetics of physical and mental characteristics of man; heredity and environment; genetics of human populations.
- 577. Developmental Genetics.** (3:3:0) S. (Offered 1971-72 and alternate years) Prerequisites: Zool. 483; and Zool. 376 or Bot. 376. Bradshaw  
Control of gene expression during embryonic development; genetic mechanisms of cell differentiation.
- 578. Radiation Biology.** (2:2:0) F. Prerequisites: Biol. 201; Physics 202; Chem. 352. Farmer  
Interaction of radiation with matter, and effects of radiation on living systems.
- 581. Experimental Embryology.** (2:1:3) S. Prerequisite: Zool. 483. Bradshaw  
Formerly Zool. 573.
- 582R. Advanced Topics in Embryology.** (2:2:0 ea.) F. Prerequisite: Zool. 483. Bradshaw  
Formerly Zool. 695.
- 583. Etiology and Pathology of Brain Injury.** (3:2:2) F.S. Prerequisite: consent of instructor. Chapman  
May not be used for credit toward a major in zoology. Formerly Zool. 563.

- 584. Neurology.** (2:1:2) S. Prerequisite: consent of instructor. Chapman  
Functional anatomy of the nervous system, including the principal nervous pathways. Formerly Zool. 564.
- 591R. Special Problems in Zoology.** (1-2:Arr.:Arr. ea.) F.S.Su. Prerequisite: consent of instructor.
- 601. Zoogeography.** (2:2:0) F. Formerly Zool. 555. Frost, Tanner
- 609. Systematic Zoology.** (2:1:2) S. (Offered 1970-71 and alternate years) Wood  
Formerly Zool. 610.
- 612. Advanced Invertebrate Zoology I.** (3:2:3) F. Prerequisite: Zool. 202 or consent of instructor. Barnes, Braithwaite  
Comprehensive biology of the lower Metazoa (Parazoa, Radiata, Acoelomata, Pseudocoelomata, and lower Protostomia).
- 613. Advanced Invertebrate Zoology II.** (3:2:3) S. Prerequisite: Zool. 612 or consent of instructor. Barnes, Braithwaite  
Comprehensive biology of the higher Protostomia and Deuterostomia, excluding the terrestrial Arthropods.
- 620. Theoretical Zoology.** (2:2:0) F. Prerequisite: consent of instructor. Tanner  
Formerly Zool. 680.
- Botany 621. Electron Microscopy.** (2:2:0)
- Botany 622. Electron Microscopy Laboratory.** (1:0:3)
- 632. Arachnology.** (3:1:6) F. (Offered 1971-72 and alternate years)  
Formerly Zool. 624. Allred, Jorgensen
- 633R. Advanced Topics in Entomology.** (1-2:Arr.:Arr. ea.) F.S.Su. Prerequisite: consent of instructor.  
Formerly Zool. 533 and 625.
- 644R. Advanced Topics in Vertebrate Zoology.** (1-4:Arr.:Arr.: ea.) S. Prerequisite: consent of instructor.  
Studies in ichthyology, herpetology, ornithology, or mammalogy. Formerly Zool. 643, 645, 646, 647.
- 651, 652. Community Ecology I, II.** (2:1:3 ea.) F.Su. Prerequisites: Zool. 451; concurrent registration in or completion of Stat. 501 and 502 or their equivalents. Smith, White  
Principles of community ecology and methods of research. Field trips scheduled five Saturdays.
- 657R. Advanced Topics in Ecology.** (2:2:0 ea.) F.S.  
The specific topic will be announced at the beginning of each semester.  
Formerly Zool. 690.
- 662. Advanced Physiology I.** (2:1:2) F. Prerequisite: Zool. 465 or consent of instructor. Jaussi, Heninger
- 663. Advanced Physiology II.** (2:1:3) S. Prerequisite: Zool. 465 or consent of instructor. Jaussi, Heninger
- 681. Advanced Histology.** (2:0:4) F. (Offered 1971-72 and alternate years) Pre-requisite: Zool. 380. Chapman  
Formerly Zool. 670.
- 696R. Graduate Seminar.** (½:1:0 ea.) F.S.Su.
- 699. Thesis for Master's Degree.** (Arr.) F.S.Su.
- 799. Dissertation for Ph.D. Degree.** (Arr.) F.S.Su.

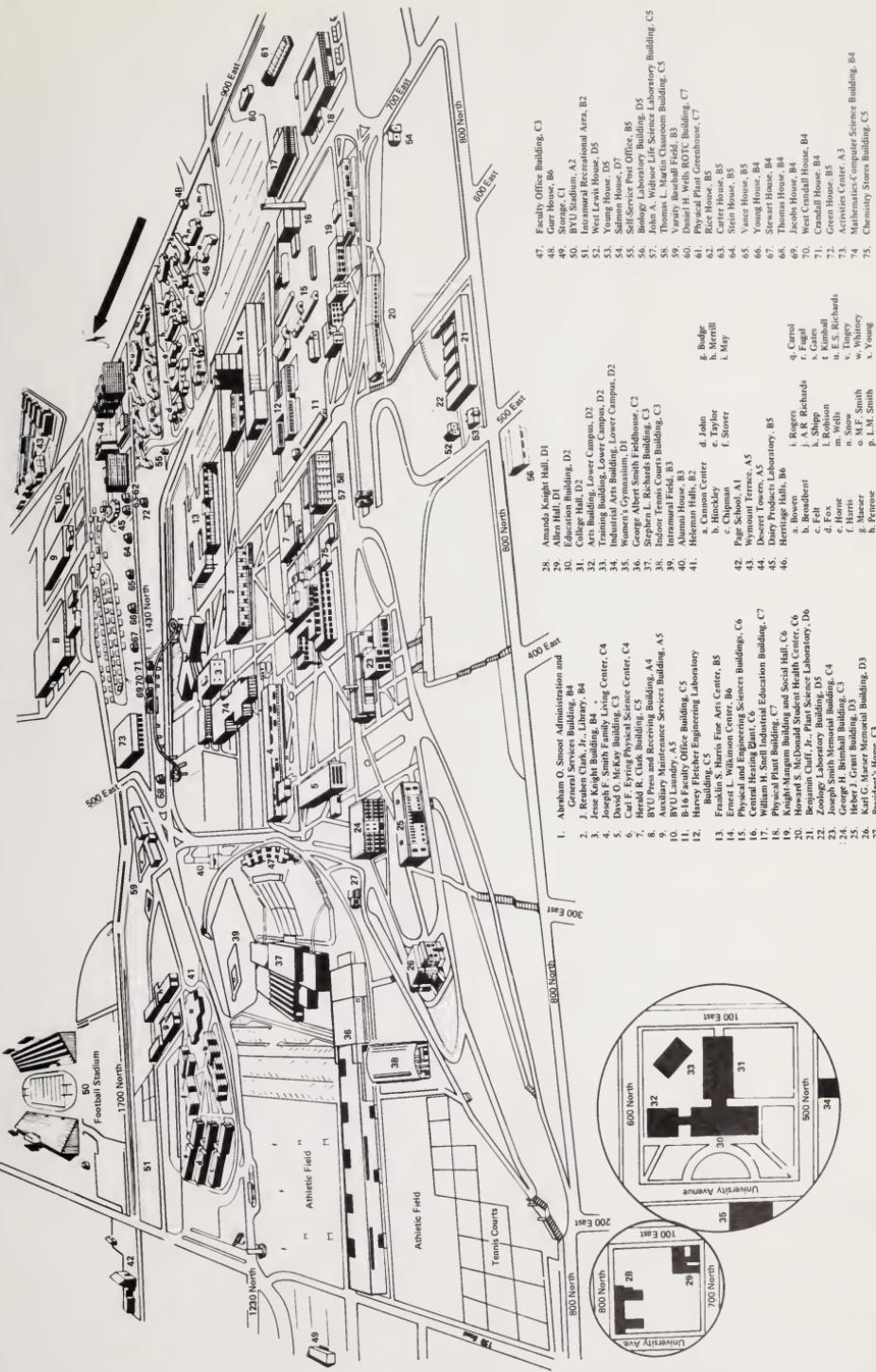


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Ariel S. Ballif  
Sociology  
A-245 ASB